State of California

Business, Transportation and Housing Agency

Memorandum

To: DEPUTY DISTRICT DIRECTORS
PROJECT DEVELOPMENT

Date: March 14, 1994

File No.:

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF STATE AND LOCAL PROJECT DEVELOPMENT

Subject: Air Quality Analysis of Ramp Metering

Concern has been expressed that the installation of ramp metering potentially contributes to the occurrence of carbon monoxide (CO) "hot spots" (i.e., local areas where CO concentrations exceed either the 1-hour, or more typically, the 8-hour standards). This has precipitated a variety of modeling efforts in an attempt to quantify the air quality effects of ramp metering. These efforts have served to again point out the severe limitations that exist in our ability to accurately quantify the local or microscale air quality implications of transportation facilities.

A major factor contributing to these limitations is that the approved vehicle emission factors represent vehicle emissions averaged over a variety of operating conditions. These factors do not lend themselves to calculating emissions associated with a particular operating feature, such as at a metered ramp.

There have been attempts at what is termed "modal" modeling at metered ramps, wherein vehicle emissions associated with particular operating modes (i.e., varying accelerations, decelerations, cruising, etc.) are estimated. However, these efforts represent ongoing research. Both the vehicle emissions and the traffic modeling data are not reasonably available at this time to quantify the CO implications of ramp metering.

An additional complication is that experts at UC Davis are suggesting that the current modeling procedures for estimating 8-hour CO concentrations near major traffic-carrying facilities are flawed. Research is continuing, and the modeling implications are being discussed with the California Air Resources Board (CARB), the Environmental Protection Agency (EPA) and others.

Where does this leave us, and what is a reasonable response when attempting to assess the local CO implications of ramp metering projects?

First, a note of general perspective--the air quality monitoring unit within CARB reports that California's 8-hour CO concentration levels have, in recent years, dropped significantly. The expectation is that these levels will continue a

downward trend. Current predictions are that within the next few years, the Federal 8-hour CO standard will likely be attained in all but a couple of areas in California.

A good general guide on the limits of what is a reasonable response when developing environmental assessment information is provided in Section 1502.22 of the Federal Council on Environmental Quality's regulations for implementing the National Environmental Protection Act. In summary, if information which is relevant to a reasoned choice among alternative actions is unavailable because the means to obtain the information are not known, a statement to that effect should be provided along with a general statement as to the best estimate of the reasonably foreseeable effects.

In the case of ramp metering, what can we state with some degree of certainty about ramp metering's reasonably foreseeable effects?

- The Federal Clean Air Act Amendments of 1990 allow ramp metering projects to proceed without delay even when an area is under sanctions. In making this determination, Congress stated, "highway ramp metering, traffic signalization, and related programs ... improve traffic flow and achieve a net emission reduction".

- There has been some speculation that metering ramps causes the vehicles using these ramps to accelerate more rapidly and release greater emissions. However, this has not been conclusively shown to occur.

  Further, even if, as some speculate, emissions from vehicles using metered ramps are increased from those using nonmetered ramps, it is likely that emissions from the facility as a whole are reduced with ramp metering.

  The volume of traffic on metered ramps is quite small as compared to the mainline. And, as ramp metering reduces "stop and go" conditions on the mainline, emissions from the comparatively large number of mainline vehicles are reduced. Therefore, the best estimate of the reasonably foreseeable effects of ramp metering is an overall net reduction in emissions, which in turn will contribute to a reduction in the likely occurrence of localized "hot spots."

- Among the benefits of metered ramps is the optimization of mainline capacity by minimizing operational failures ("stop and go" conditions). This is important in considering the effect on local streets. When operational failure occurs, the carrying capacity reduces; therefore, diversion of traffic onto local streets is more apt to occur without metered ramps.

In the meantime, the Department and UC Davis are continuing research efforts, cooperatively with CARB, FHWA and EPA. This is expected to result in updated and refined local CO assessment tools and procedures. Additionally, we are continuing research into both the traffic and emission aspects of "modal" modeling. The Department has also committed to continuing the current in-field monitoring of CO levels near existing metered ramps in the San Jose area, which thus far have shown CO levels to be substantially less than standards.

If there are any questions on this matter, please contact Steve Borroum with the Office of Project Planning and Design at (916) 263-3414, ATSS 435-3414

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State of California
Department of Transportation
District 4

Carbon Monoxide Concentrations Adjacent to Ramp Meters

SCL-101 at Blossom Hill Blvd.
SCL-280 at De Anza Blvd.
Santa Clara County
Winter 1993-94

May 20, 1994

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NOTICE

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CONVERSION FACTORS

English to Metric System (SI) of Measurement

Quantity	English unit	Multiply by	To get metric equivalent
Length	inches (in)or(")	25.40	millimetres (mmm)
		.02540	metres (m)
	feet (ft)or(')	.3048	metres (m)
	miles (mi)	1.609	kilometres (km)
Area	square inches (in^2)	6.432×10^{-4}	square metres (m^2)
	square feet (ft^2)	.09290	square metres (m^2)
	acres	.4047	hectares (ha)
Volume	gallons (gal)	3.785	litres (l)
	cubic feet (ft^3)	.02832	cubic metres (m^3)
	cubic yards (yd^3)	.7646	cubic metres (m^3)
Volume/Time (Flow)	cubic feet per second (ft^3/s)	28.317	litres per second (l/s)
	gallons per minute (gal/min)	.06309	litres per second (l/s)
Mass	pounds (lb)	.4536	kilograms (kg)
Velocity	miles per hour (mph)	.4470	metres per second (m/s)
	feet per second (fps)	.3048	metres per second (m/s)
Acceleration	feet per second squared (ft/s^2)	.3048	metres per second squared (m/s^2)
	acceleration due to force of gravity (G)	9.807	metres per second squared (m/s^2)
Weight Density	pounds per cubic (lb/ft^3)	16.02	kilograms per cubic metre (kg/m^3)
Force	pounds (lbs)	4.448	newtons (N)
	kips (1000 lbs)	4448	newtons (N)
Thermal Energy	British thermal unit (BTU)	1055	joules (J)
Mechanical Energy	foot-pounds (ft-lb)	1.356	joules (J)
	foot-kips (ft-k)	1356	joules (J)
Bending Moment or Torque	inch-pounds (ft-lbs)	.1130	newton-metres (Nm)
	foot-pounds (ft-lbs)	1.356	newton-metres (Nm)
Pressure	pounds per square inch (psi)	6895	pascals (Pa)
	pounds per square foot (psf)	47.88	pascals (Pa)
Stress Intensity	kips per square inch square root inch (ksi $\sqrt{in}$)	1.0988	mega pascals $\sqrt{metre}$ (MPa $\sqrt{m}$)
	pounds per square inch square root inch (psi $\sqrt{in}$)	1.0988	kilo pascals $\sqrt{metre}$ (KPa $\sqrt{m}$)
Plane Angle	degrees (°)	0.0175	radians (rad)
Temperature	degrees fahrenheit (F)	$\frac{tF - 32}{1.8} = tC$	degrees celsius (°C)

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In the author's opinion, Dianne Steinhauser deserves a big cheer for instigating this study despite numerous obstacles.

Special thanks to John Tougher, Apple Computer Inc., for keeping an eye on our van and letting us plug in to their electric power. Saving the most heartfelt for last, a very special thanks goes to Mr. Henry Choe who generously offered the use of his back porch, and extended his hospitality to our field crew on virtually a weekly basis. Without his civic-mindedness, this study would have been limited to one site, greatly reducing its value.

SUMMARY

Table 1 — Highlights of Pertinent Data and Information

Location	SCL-280 Eastbound at De Anza Blvd. in Cupertino SE of stop bar South of and next to accel link		SCL-101 Northbound at Blossom Hill in San Jose SE of stop bar East of and next to queue	
Ramp Configuration	3 lanes: 2 mixed + 1 HOV PM Metering		2 lanes: 1 mixed + 1 HOV AM Metering	
Averaging Time	1-hour	8-hour	1-hour	8-hour
CA Standards Fed Standards	20.0 ppm 35 ppm	9.0 ppm 9 ppm	20.0 ppm 35 ppm	9.0 ppm 9 ppm
Maximum Day Date Time	**6.9 ppm** Wed. 1/19/94 0900-1000	**4.8 ppm** Fri. 1/14/94 & Thurs. 1/20/94 ********** assorted 1200-2000 to 1500-2300	**7.3 ppm** Sat. 1/15/94 0000-0100	**6.1 ppm** Fri. 1/14/94 2100 to Sat. 1/15/94 0500
BAAQMD Stations: **Actual — during above maximum**	**6.9 & 8.5 ppm**	n/a	**4.7 & 7.9 ppm**	n/a
BAAQMD Stations: 1989 Isopleth Rollback Factor **1994 Isopleth**	15 ppm x 0.77 = **11.6 ppm**	9 ppm x 0.77 = **6.9 ppm**	15 ppm x 0.77 = **11.6 ppm**	9 ppm x 0.77 = **6.9 ppm**
Ramp Sites: 1989 Isopleth Rollback Factor **1994 Isopleth**	12 ppm x 0.77 = **9.2 ppm**	7 ppm x 0.77 = **5.4 ppm**	9 ppm x 0.77 = **6.9 ppm**	6.5 ppm x 0.77 = **5.0 ppm**
Max. Traffic: On-ramp Hour Mainline Hour Mainline Daily	**1450 vph** 7600 vph 94,000 vpd		**550 vph** 6950 vph 63,000 vpd	

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INTRODUCTION

THE CHALLENGE

In late 1991, the California Department of Transportation (Caltrans) was asked by two of our fellow transportation partner agencies in the San Francisco Bay Area, the Metropolitan Transportation Commission (MTC) and the Bay Area Air Quality Management District (BAAQMD), to account for carbon monoxide (CO) emissions due specifically to vehicle acceleration at freeway on-ramp meters.

The impetus for this request was a preliminary summary of California Air Resources Board (ARB) research on vehicle acceleration emissions which suggested that acceleration emissions were significantly higher than previously thought, and in fact were responsible for the vast majority of total vehicle emissions.

In response to these concerns, the Caltrans District 4 (SF Bay Area) Environmental Engineering Branch requested the assistance of the Caltrans Headquarters Division of New Technology and Materials (NTM&R), formerly known as Translab, in modifying the CALINE4 air pollutant dispersion model to address accelerations and speeds higher than the intersection link capability of CALINE4 could handle. Initially, NTM&R planned on incorporating the eventual results of the ARB research, but when ARB decided not to complete their study, Caltrans was left with only *qualitative* answers to a *quantitative* question which remained on the table.

INITIAL EFFORTS

Although much good faith effort was spent over 1992 and 1993, due to the lack of relevant research data on both a) vehicle acceleration behavior at ramp meters, and b) the relationship between acceleration behavior and emissions rates, NTM&R's attempts to modify the CALINE4 dispersion model and District 4's attempts to actually model ramp meter emissions ultimately proved unsuccessful.

(The ALA-880 TOS Cornerstone Project, which contained extensive ramp metering, and at least one minor project, were analyzed using a developmental version of CALINE4 known as "CALINE4 Beta Eta 2." Approval to use this version was later withdrawn due in part to Beta Eta 2's inexplicably high results.)

On September 15, 1993, MTC distributed a "Small Project Guidance" to project sponsors allowing for a simple four-question assessment of traffic and geometric factors for qualifying projects in high background (> 6 ppm) CO areas, principally Santa Clara County. MTC staff have stated that for qualifying projects in low background (≤ 6 ppm) CO areas, the CO assessment need not be done at all.

MTC has interpreted their Small Project Guidance as not applicable to ramp metering projects. Caltrans cited specific mention of "traffic signal installations" as one basis for inclusion, but MTC cited the widening of on-ramps — done for either vehicle storage or HOV bypass purposes — as the basis for exclusion. (See discussion of MTC Resolution No. 2270 below.) On the other hand, neither agency felt ramp metering belonged grouped with "major" projects; both agencies agreed ramp metering projects deserved some kind of special treatment.

FIELD STUDY

Immediately thereafter, the District 4 Environmental Engineering Branch decided to initiate a CO monitoring study adjacent to two operational ramp meters during the winter 1993-94 CO season, the results of which are presented herein. The goal of this investigation was to measure what we could not model, and determine as best we could the real-world impacts of ramp metering on adjacent local CO concentrations.

Efforts were made to select sites with the highest likelihood of finding CO hot-spots. Eventually, two sites were found which met all of the selection criteria; the De Anza Blvd. on-ramp to southbound SCL-280 (PM peak period, 2 SOV + 1 HOV), and the Blossom Hill Blvd. on-ramp to northbound SCL-101 (AM peak period, 1 SOV + 1 HOV).

At a meeting held January 20, 1994, preliminary investigation results were presented to MTC and BAAQMD, indicating CO levels well below standards at both sites. An action plan was formulated and later confirmed in a letter from MTC to Caltrans, dated February 18, 1994. Pending fulfillment of the action plan, which includes concurrence on a methodology which references this report, MTC will be able to review ramp metering projects for conformity based on the new approach.

BACKGROUND

REGULATORY

The Federal Clean Air Act and Conformity

The Federal Clean Air Act as amended in 1990 (FCAAA), requires that all transportation plans, programs, and projects which are funded or approved under title 23 U.S.C. or the Federal Transit Act be found to "conform" to the intent of the applicable State Air Quality Implementation Plan (SIP), which for the SF Bay Area is still the 1982 Bay Area Air Quality Plan. The Final Transportation Conformity Rule, promulgated by the Environmental Protection Agency (EPA), effective December 27, 1993, established the criteria and procedures for making these conformity determinations.

For FHWA/FTA projects, one of these criteria is that the **"project must not cause or contribute to any new localized CO or PM-10 violations or increase the frequency or severity of any existing CO or PM-10 violations in CO and PM-10 nonattainment and maintenance areas."** The Rule goes on to provide for flexibility in how those determinations are made: **"...this criterion may be satisfied if consideration of local factors clearly demonstrates that no local violations presently exist and no new violations will be created as a result of the project."** (See §51.424 or §93.116.)

In CO nonattainment areas during the Interim and Transitional periods preceding adoption of a SIP which incorporates the Final Rule, projects must additionally **"...eliminate or reduce the severity and number of (existing) localized CO violations in the area substantially affected by the project..."** This requirement is also followed by a sentence which includes the phrase: **"...this criterion may be satisfied if consideration of local factors clearly demonstrates..."** (See §51.434 or §93.121.)

The Final Conformity Rule emphasizes the timely implementation of Transportation Control Measures (TCMs) in the applicable SIP, presumably in recognition of their implicit benefit to <u>regional</u> air quality, while simultaneously <u>not</u> exempting TCM projects as a general category from any conformity requirements, particularly those related to <u>localized</u> CO violations. Ramp metering is an integral component of both SIP TCM #4, "High Occupancy Vehicle Lanes and Ramp Metering," and the Traffic

Operations System (TOS) included in SIP TCM #26, "Incident Management on Bay Area Freeways," from the SIP's Contingency Plan

Lastly, in a discussion of project types which may proceed under sanction, the Congressional record states Congress intended to include, **"highway ramp metering, traffic signalization, and related programs that improve traffic flow and achieve a net emission reduction."**

In sum, although ramp metering is not exempt from conformity determinations or CO hot-spot evaluations, Congress does regard ramp metering as beneficial to overall emissions levels, and to the extent ramp metering is included in SIP TCMs, ramp metering should be implemented expeditiously.

MTC Resolution No. 2270

Particular to the San Francisco Bay Area and as the result of a lawsuit over implementation of the 1982 Bay Area Air Quality Plan, MTC Resolution No. 2270, adopted April 17, 1991, requires a detailed conformity analysis of "major" federal-action projects to determine the project's impact on local and corridor scale CO emissions. The definition of "major" project includes:

> **"... one which increases the capacity of the highway system through... (b) significant widening or addition of one or more lanes to an existing highway or (c) improvement of traffic flows through addition of ingress or egress facilities on or between existing highways."**

Analysis requirements for major projects include detailed travel demand forecasting and carbon monoxide analysis in order to satisfy MTC's "Project Sponsor Guidance and Checklist for Carbon Monoxide Analysis Performed for Conformity Assessment of Transportation Projects," revised March 1993.

For projects <u>other</u> than "major projects," MTC Resolution 2270 gives four examples of ways by which project sponsors can show **"it can reasonably be demonstrated the project, when taken as a whole, will reduce or eliminate, or not interfere with the reduction or elimination of, the severity and number of carbon monoxide violations in the area substantially affected by the project,"** the last example of which is, **"Any other method which demonstrates that the project will not increase carbon monoxide emissions."**

Assuming ramp metering could be regarded as a non-major project, this study was intended to be the heart of such a reasonable demonstration.

MODELING LIMITATIONS

Typically, local carbon monoxide concentration or "hot-spot" modeling for transportation projects in California is done using CALINE4, a line source pollutant dispersion model developed by Caltrans. CALINE4 uses project and site geometrics, worst-case meteorological assumptions, forecasted traffic speeds and volumes, and composite vehicle emissions rates to predict vehicle-based carbon monoxide concentrations at selected "receptor" locations which are then added to background CO levels from BAAQMD isopleth maps to arrive at a total. The composite emissions rates are derived from the EMFAC series of vehicle emissions factors published by the California Air Resources Board (ARB), the most recent version of which is EMFAC7F v1.1. The isopleth values can be modified by rollback factors which reflect the steady improvement of regional CO levels over time.

The EMFAC7F emissions factors are based on average driving speeds and do not break vehicle emissions out into "modal" emissions segregated into idle, cruise, acceleration, and deceleration. This is a key concept.

While CALINE4 is capable of predicting vehicle emissions at city street intersections by using an algorithm which derives modal emissions from EMFAC rates, initial attempts to use either this intersection link capability, or later a modified acceleration link version of CALINE4 known as "Beta Eta 2," to model metered freeway on-ramps yielded unbelievably high results and were abandoned as unrealistic.

With regard to ramp metering and acceleration emissions, the following points illustrate the current limits of CO hot-spot modeling capability:

- EMFAC7F emissions factors are neither modal nor specific to the particular characteristics of either freeways or ramp metering — they represent an estimation of emissions rates at various average speeds over a driving cycle (which begins and ends at zero speed) by applying "speed correction factors" to adjust for speeds above and below the 7.2 m/s (16 mph) average of the standardized Federal Test Procedure (FTP) 75 driving cycle. Just as EMFAC rates can not reflect the emissions differences between a steady speed and a

standing-start sprint with the same average speed, they similarly can not differentiate between steady flow and slow-and-go flow of a given average speed on the mainline. EMFAC is simply too general for a feature-specific evaluation of any transportation facility.

- Reasonable assumptions of vehicle acceleration behavior (whether obtained through basic constant-acceleration physics equations, or empirically through test car runs where actual acceleration was inversely related to speed) result in the key acceleration-average speed product, AxS (mi^2/hr^2-sec), frequently falling well above the range valid for use in CALINE4's exponential modal emissions equation.

- The CALINE4 intersection link algorithm assumes a time-weighted or "front-loaded" distribution of acceleration emissions and staggered starts of varying acceleration rates as one moves through the queue, whereas ramp metering starts are all from the stop bar. Furthermore, recent preliminary ARB research suggests "end-loaded" emissions distribution.

- Additionally, though CALINE4 was written in 1989, the intersection algorithm was based on data from 1975 and 1976 model year automobiles.

- Although there has been much speculation recently that acceleration events are responsible for a large share of vehicle emissions, insufficient research has been done to date on the emissions rates of modern vehicles in the acceleration mode to be able to model or quantify acceleration emissions.

DESCRIPTION OF WORK

GENERAL LOCATION AND SITE SELECTION CRITERIA

Field sites in the general San Jose area (See Exhibit 1) were deemed desirable for the following two reasons:

1) The highest sub-regional background CO levels in the San Francisco Bay Area are found in the San Jose area. BAAQMD isopleth maps (1989, revised August 1991) and rollback factors (revised June 1993) combine to indicate that in 1994, expected

background CO levels in downtown San Jose can be as high as 11.6 ppm for a 1-hr period, and 6.9 ppm for an 8-hour average. (See Appendix A.)

2) Ramp meters are currently operational on a number of mainline sections in the general San Jose area and under consideration on others in the same area, including the southbound SCL-101 corridor from Palo Alto to San Jose.

Additionally, the physical situation of the monitor devices themselves clearly had to be both serviceable by the research team and meaningfully representative of actual worst-case sensitive receptors. This led to a doorbell campaign which was eventually successful in recruiting two cooperative volunteers from the limited pool of residents and businesses located directly adjacent to, and downwind of (reasonably assumed to be southeasterly of the stop-lines) candidate ramp meters. (See Appendices H, I and J.)

In sum, the following criteria were used to select usable sites which were as representative as possible of worst conceivable sensitive receptor location and conditions:

- operational multi-lane metering, preferably at least one AM and one PM,
- high sub-regional background CO levels,
- high mainline peak period volume and congestion,
- high peak period ramp volumes,
- monitors in close downwind proximity to acceleration links,
- protection from the elements for equipment,
- continuous access to electrical power,
- intermittent or continuous access for field personnel.

SITE DESCRIPTIONS

Site #1 — De Anza Blvd. On-ramp to S/B 280 in Cupertino

(See Exhibit 2.) The on-ramp configuration consists of 3 metered lanes; 2 mixed flow, 1 HOV bypass. (In Dist 4, HOV cars do have to stop, but get green light instantly.) On-ramp lanes all merge into one auxiliary lane with an option either to merge into the fourth through lane or exit at the next interchange. The adjacent mainline is 8 lanes wide, 3 mixed flow and one HOV lane each direction, and has a narrow median. The open end of the sampling tube was 38 m (125 ft.) downstream or east of the stop bar and approx. 12 m (40 ft.) offset or south of the edge of the acceleration lane, and at ground

level. We chose to trade sampling height (ground level) for proximity (12 m (40 ft.) closer). The actual Dasibi analyzer was 12 m (40 ft.) farther away to the south, locked in a Caltrans van in Apple Computer's parking lot. Between the on-ramp and the parking lot is a Santa Clara Co. flood control concrete lined channel.

Site #2 — Blossom Hill Rd. On-ramp to N/B 101 in South San Jose

(See Exhibit 3.) The on-ramp configuration consists of 2 metered lanes; 1 mixed flow, 1 HOV bypass. The adjacent mainline is 8 lanes wide, 3 mixed flow and one HOV lane each direction, and has a wide median. The open end of the sampling tube was 30 m (100 ft.) upstream or south of the stop bar and approx. 21 m (70 ft.) offset or east of the queue, elevation 1.5 m (5 ft.), tied off in a tree. The Dasibi analyzer was 6 m (20 ft.) away in an enclosed patio of a private citizen's home. Between the on-ramp and the back yard are two overlapping 4.3 - 4.9 m (14-16 ft.) soundwalls.

BAAQMD PERMANENT MONITORING STATIONS

"SJSC" or "Burbank" — 1866 West San Carlos in San Jose

Located between Irving Av. and Leland Av., and approximately:

- 1.3 km (0.8 mi) northeasterly of the 17/280/880 interchange in San Jose,
- 3.9 km (2.4 mi) west and slightly south of the BAAQMD monitoring station on North 4th Street,
- 9.7 km (6 mi) east of Site #1 at 280/De Anza Blvd. in Cupertino,
- and 14 km (8.5 mi) northwest of Site #2 at 101/Blossom Hill Rd in South San Jose.

"SJ4T" or "San Jose" — 120 North 4th Street in downtown San Jose

Located near St. John Street, and approximately:

- 1 km (1 mi) north of the 87/280 interchange,
- 3.9 km (2.4 mi) east and slightly north of the BAAQMD monitoring station on West San Carlos Street,
- 12 km (7.5 mi) northwest of Site #2 at 101/Blossom Hill Rd in South San Jose,
- and 13 km (8 mi) east of Site #1 at 280/De Anza Blvd. in Cupertino.

EQUIPMENT AND METHOD

(See Appendix B.) Similar equipment at both sites allowed for continuous monitoring of CO concentrations by Dasibi Environmental Corporation Gas Filter Correlation CO Analyzers. Data was initially recorded on data loggers in 5-minute averages which were then reported on a 1-hour basis and down-loaded weekly to a portable computer. Rolling 8-hour averages were calculated later.

The Dasibi equipment was operated in compliance with US EPA designated reference method RFCA-0488-067, April 1988, approved range 0 - 50 ppm. Thermostatically controlled oil-filled space heaters were used to maintain nocturnal temperatures within the ranges specified by both Dasibi and US EPA. Thermostat and power settings were established using a thermograph during a shakedown period before data was collected.

At the SCL-280 site, the equipment was housed in a van. At the SCL-101 site, equipment was housed in the enclosed back patio of a private home. Tygon tubing was used to convey sampled air to the Dasibi analyzers.

Additionally, at the SCL-280/De Anza Blvd. site, a Solomat Co. Automatic Weather Station connected to a Solomat Co. Wind Monitor mounted atop a 7 m (20 ft.) mast attached to the van was used for continuous measuring of wind speed and wind direction. Data was recorded internally and then reported on a 15-minute average and down-loaded weekly to a PC.

DATA, ANALYSIS, AND DISCUSSION

This study makes no attempt to either validate or challenge the CALINE4 dispersion model in that we did not collect or analyze data on a detailed enough level to derive quantitative relationships between the many variables which affect the CO concentration at any given receptor.

The general thinking was that if no exceedences were observed, the level of detail undertaken in this study would, in hindsight, be deemed sufficient. If exceedences were measured, more detailed research to determine contributing sources and factors (i.e., differentiation of background CO, mainline emissions, and on-ramp emissions; statistical analysis of traffic and meteorological conditions, etc...) would be indicated.

FIELD DATA FROM ON-RAMP SITES

Traffic Counts

Traffic Data (see Appendix G) is summarized below in Table 2.

Hourly vehicle counts were collected on five mid-week days in December and January for southbound SCL-280 including two mid-week afternoon commute periods for the De Anza Blvd. southbound on-ramp while the meter was on.

Hourly vehicle counts were collected over a span of 27 weekdays in January and February for northbound SCL-101 and 24 morning commute periods for the Blossom Hill Rd. northbound on-ramp while the meter was on.

No data was collected on the following: vehicle counts in the off-peak direction, vehicle speeds, ramp volumes while meters were off, or queuing behavior.

Table 2 — Traffic Data

	SB SCL-280 De Anza Blvd.	NB SCL-101 Blossom Hill Rd.
Metered Hours	3 - 6 PM	5 - 9 AM
Ramp Configuration	3 Lanes; 2 SOV + 1 HOV	2 Lanes; 1 SOV + 1 HOV
Peak On-Ramp Hour	3 - 4 PM	7 - 8 AM
Peak Mainline Hour(s)	4 - 6 PM	7 - 8 AM
Maximum On-Ramp Volume	1450 vph	550 vph
Maximum Mainline Volume	7600 vph	6950 vph
Total Mainline Volume	94,000 vpd	63,000 vpd

Wind Speed and Wind Direction at the SCL-280 Site

An explanation of azimuth direction: 0 degrees refers to wind from the north; 90 degrees, wind from the east, etc. At the SCL-280 site, wind out of the north (0 or 360 degrees) would blow transversely across the acceleration link and directly at our receptor. A wind out of the west-by-northwest (approximately 285 degrees) would blow directly from the stopline toward our receptor. (See Exhibit 2.)

Wind speed and wind direction data were gathered at the SCL-280 site starting December 29 and continuing to the end of the study, on 15-minute averages. A number of days of wind data were lost in mid-January, including the morning of January 19 when the SCL-280 site registered its highest 1-hour CO reading, the third-highest overall, of 6.9 ppm.

Between December 29 and January 14, we captured 7 full days and 3 half days of simultaneous wind speed, wind direction, and CO concentration data (see Appendix E). Though the plots of all three parameters are understandably erratic, visual inspection reveals wind direction generally from the west, wind speeds typically in the 1 to 2 m/s (2 to 4 mph) range with occasional 15-minute averages as low as zero and as high as 3.6 m/s (8 mph), and 1-hr CO concentrations ranging from 0.9 to 6.3 ppm. (Please note the BAAQMD-recommended minimum wind speed to use in a CO hot-spot analysis is 1.0 m/s (2.2 mph).)

Table 3 shows the three highest CO readings at the SCL-280 site for which there was simultaneous wind data during mid-January, when the highest CO levels were observed. The reader may note that all three events occurred during commute periods; there appears to be no relationship to metering status or direction of peak flow; the wind speeds are clearly low enough to be considered worst-case; and the wind directions in the first two cases are within 15 degrees of the receptor/stop-line azimuth .

Table 3 — Selected Wind and CO Events at SCL-280

Time, Meter Status	1-hr CO	Ave. Wind Azim.	Ave. Wind Speed
Tues., 1/11/94, 1700-1800 (ON)	6.2 ppm	300 deg. (W-NW)	1.3 m/s (3 mph)
Wed., 1/12/94, 0800-0900 (OFF)	6.3 ppm	270 deg. (West)	1.0 m/s (2.3 mph)
Fri., 1/14/94, 0800-0900 (OFF)	6.3 ppm	245 deg. (W-SW)	0.7 m/s (1.6 mph)

1-hr CO Levels at On-Ramps

The maximum observed 1-hour CO levels — 7.3 ppm at SCL-101 and 6.9 ppm at SCL-280 — are both well below State and Federal 1-hr CO standards of 20 ppm and 35 ppm respectively.

Exhibits 4 and 5 show the 1-hr CO concentrations at the two on-ramp sites over the 11-week study as a function of time-of-day. (Unless otherwise noted, hours in exhibits reflect a start-of-hour convention, i.e., 0800 means the period between 0800 and 0855.)

This point of view illustrates the diurnal cycle of CO fluctuation; CO levels are clearly related to time-of-day. Higher CO levels appear to correspond with peak travel demand periods.

Exhibits 6 and 7 show an alternate view of the 1-hour CO concentrations, but over the month of January only. (These two exhibits use an end-of-hour convention, i.e., 0800 means the period between 0705 and 0800.)

Note the contrast between the dense data and "double-hump" characteristics of the SCL-280/De Anza Blvd. site (despite its PM-only metering), and the more distributed data and "single-hump" characteristics of the SCL-101/Blossom Hill Rd. site (AM-only metering). We theorize that the double vs. single hump is a reflection of both AM and PM congestion at SCL-280, but AM-only congestion at SCL-101; and the variation in data density is a reflection of meteorological conditions being more varied in South San Jose than Cupertino.

Accepting for a moment the hypothesis that vehicle emissions rates are much higher in acceleration mode, it is particularly striking that the peak period 1-hour CO levels at the two sites are so similar, given the huge disparity in on-ramp volumes: 1450 vph at 280/De Anza vs. 550 vph at 101/Blossom Hill.

8-hr CO Levels at On-Ramps

The maximum calculated 8-hour CO levels — 6.1 ppm at SCL-101 and 4.8 ppm at SCL-280 — are both well below State and Federal 8-hr CO standards of 9 ppm.

Exhibit 8 shows the daily maximum of calculated 8-hour CO concentrations at both sites over the 11-week study as a function of date on which the rolling eight-hour average started.

This point of view illustrates the fluctuations of worst daily 8-hour CO levels over the course of time.

In general, 8-hour averages at SCL-280 in Cupertino are slightly higher than at SCL-101 in South San Jose, perhaps reflective of population density. Nevertheless, during the period of January 12th to 17th, there was clearly some kind of sub-regional anomaly which caused 8-hour CO levels at the South San Jose site to be unusually high, and atypically higher than at the Cupertino site. As will be discussed below in more detail, the BAAQMD measured its season high during this week as well.

Exhibits 9 and 10 are simply excerpts from Exhibits 4 and 5, selected and highlighted to show the hourly behavior during the days on which the 8-hour averages were at their peak. (The actual hours contributing to the 8-hour peaks fall between Noon and 11 PM at SCL-280, and from 9 PM to 5 AM at SCL-101.)

Please note that the meters in this study are never operational more than four of the hours in an 8-hour average. (SCL-280/De Anza = 3 hrs; SCL-101/Blossom Hill = 4 hrs.)

Sampling Plan and OBSMAX Analysis

According to the procedure in the Caltrans Air Quality Technical Analysis Notes (AQTAN) for planning a proper sampling program, continuous sampling from mid-December through the end of January, as per this study, can be anticipated to have a 95% probability that the season's first annual maximum 1-hour and 8-hour values would be captured.

(For information only: For the purpose of collecting background CO data, the AQTAN procedures also recommend a setback distance from existing facilities to the monitors based on average daily traffic (ADT). Those distances calculate to 630 m (2100 ft) at the SCL-101 site and 940 m (3100 ft) at the SCL-280 site, thirty to eighty times farther respectively than the actual monitor offsets.)

All field CO data was loaded into the OBSMAX (Observed Maximum Analysis) program (see Appendix D) which sorts and graphs 1-hour and 8-hour maxima by time

of day, and calculates the probability, also by time of day, of having observed same. According to OBSMAX, the study resulted in a 97% probability of having observed maximum values. OBSMAX also found that no "outliers" were found in the data.

COMPARISON WITH BAAQMD STATIONS

In the following comparisons of on-ramp observations and BAAQMD station data (See Appendix F), the following liberty was taken: Rather than match hours exactly, the highest corresponding values were drawn from a time window of two to three hours before and after the occurrence of the event under evaluation. This nearly always results in some escalation of the other three values, and is done so as to allow for potential CO cloud migration, thereby painting a more conservative and yet more balanced picture of the dynamic sub-regional air mass.

Despite their relative proximity of 4 km (2.4 miles) to each other, the two monitoring stations reported 1-hour CO concentrations more than 3 ppm different from each other during three of the seven discrete event periods reported below. During the other four event periods, they agreed within 1.5 ppm, once matching identically. We take this to be a reflection of the often uneven, inconsistent nature of sub-regional carbon monoxide distribution.

Highest On-Ramp Concentrations and Corresponding BAAQMD Station Data

The following facts are apparent from the on-ramp measurements, (see Exhibit 11):

- The four highest on-ramp CO concentrations all occurred in a two-week span in January, between Thursday the 6th, and Wednesday the 19th.
- Chronologically speaking, the first, second and fourth occurred during AM commute periods, the third occurred late on a Friday night.
- Quantitatively speaking, the first, second and fourth highest on-ramp CO concentrations were measured at the SCL-101 Site.
- The third highest on-ramp CO concentrations was measured at the SCL-280 Site.

- The first and third highest on-ramp CO concentrations were measured when the ramp meters were off.
- The second and fourth highest on-ramp CO concentrations were measured when the ramp meters were on.

There appears to be no relationship between the four highest on-ramp observations and whether the ramp meters are on or off. While three of the four high events did occur during AM commute periods, it is unknown whether the levels would have been higher, lower, or unchanged if the meters were not on or had never been installed, especially given that one of the three AM commute high events was located at the SCL-280 site which has PM metering only.

It is also noteworthy that three of the four highest on-ramp observations occurred at the SCL-101 site in South San Jose, despite a number of factors which suggest the SCL-280 site in Cupertino should have exhibited the higher CO levels. Relative to the SCL-280 site, the SCL-101 site:

- is located in an area of lower background CO (1-hr = 6.9 ppm vs. 9.2 ppm),
- is located farther from the acceleration link, (40 m (130 ft.) vs. 12 m (40 ft.)),
- and has nearly one third the peak hourly ramp traffic (550 vph vs. 1450 vph).

The following fact is apparent when the four on-ramp highs are compared with BAAQMD monitoring station data:

- During three of the four on-ramp high events, the BAAQMD reported higher or equal near-simultaneous CO concentrations. During the fourth, which occurred between 11 PM Friday January 14 and 2 AM Saturday January 15 at the southerly SCL-101 site, one BAAQMD station was higher, while the other was lower.

Highest BAAQMD Concentrations and Corresponding On-Ramp Data

The following facts are apparent from the BAAQMD monitoring stations, (see Exhibit 12):

- The four highest BAAQMD station CO concentrations occurred in an eight day span in January between Thursday, January 6 and Friday, January 14.
- Chronologically speaking, the first and third occurred during AM commute periods, the second and fourth during PM commute periods.
- Quantitatively speaking, the first and third highest BAAQMD CO concentrations were measured at the San Carlos Street Station.
- The second and fourth highest BAAQMD CO concentrations were measured at the 4th Street Station.
- As all four BAAQMD highs were found during peak periods, one ramp meter was on, while the other was off; which was which depending on AM vs. PM peak.

The following observations are noteworthy: While there appears to be a clear relationship between BAAQMD high readings and peak commute periods, there appears to be no relationship between the four BAAQMD high events and any of the following candidates for correlation: particular station, time of day, or metering status.

General On-Ramp / BAAQMD Correlation Observations

Between the seven discrete CO event periods evaluated (Thursday January 6, 6 AM - 9 AM was common to both top 4 lists) it appears that despite the directly adjacent proximity of the investigation sites to metered on-ramps, 12 m and 23 m (40 and 75 ft), higher CO levels could nearly always be found at both BAAQMD stations. The one exception to the fourteen BAAQMD readings was discussed above.

All seven CO event periods occurred in January, between the 6th and 19th, which suggests regional or sub-regional scale factors (i.e., seasonal temperature and wind patterns, or seasonal ambient CO level fluctuations), rather than local scale factors (i.e., traffic speeds and volumes, proximity to freeways or on-ramps) are predominantly responsible for the observed CO "warm-spots."

CONCLUSIONS

Based on November 1993 through February 1994 BAAQMD data and mid-December 1993 through February 1994 on-ramp site data, it is reasonable to conclude that this investigation spanned the peak of the winter 1993-1994 CO season, which appears to have occurred in mid-January.

In 10 weeks of continuous CO concentration monitoring during the winter CO season directly adjacent to two multi-lane ramp meters feeding peak period-congested stretches of freeway in the highest CO background concentration sub-region in the San Francisco Bay Area, **no violations of either State or Federal 1-hour or 8-hour CO standards were observed.**

Moreover, the margin between the field data and any of the standards is never less than 12 ppm for 1-hour CO levels and 2.9 ppm for 8-hour levels. This buffer is large enough that one could even add the difference between the ramp site and monitoring station isopleth values to the observed on-ramp data and still not violate any state or federal CO standard. **All other factors being equal, this realization allows the conclusions of this study to reasonably apply to all locations in the San Francisco Bay Area, even those in downtown San Jose.**

While there is clearly a relationship between peak driving periods and monitored CO levels, the site data give no reason to believe that CO concentrations adjacent to ramp meters ever exceed the state or federal CO standards.

It is important to note that to some degree, one would expect lower monitoring results than one would obtain through modeling, assuming a valid model existed, because of the worst-case, non-probabilistic orientation of current air quality modeling practice, and the limited number of sites and limited duration of our study.

In a way, this observation serves as cause to question the scientific validity of current concern with the microscale CO impacts of freeway projects in general; one would be hard pressed to find a site which, according to what we both know and presume about vehicle emissions, would be worse for local CO levels than the SCL-280 De Anza Blvd. on-ramp by a significant enough margin to overwhelm the margin of safety we observed.

With respect to BAAQMD data, there appears to be a clear relationship between CO concentrations measured at on-ramps and CO concentrations measured at BAAQMD monitoring stations, with a bias toward the BAAQMD monitoring stations being higher. In short, the data collected in this study would suggest air quality can easily be worse in downtown San Jose during commute periods than at any time next to freeway on-ramps, metered or not.

As modest as this study was, it represents the only known field investigation to date of the air quality impacts of ramp meters. We believe our work sheds long overdue light on a subject mired for two plus years in conservative speculation, and will serve to dispel inter-agency and public concerns over ramp metering as a threat to air quality.

IMPLEMENTATION

It is recommended that this report be distributed as an informational document to Caltrans' transportation partner agencies and members of the public who have expressed concern over possible air quality impacts of ramp metering. It is important to remember that although the conclusions were based on limited data taken at only two sites, these two sites were in the San Francisco Bay Area's highest background CO concentration sub-region, traffic was heavily congested and volumes were high, and data was collected during the height of the CO "season."

It is recommended that — in conjunction with a separate analysis of the presumably beneficial effects of ramp metering on mainline CO emissions totals — this study be accepted by Caltrans' transportation partner agencies as adequate in showing that all exclusively ramp metering projects and all ramp metering elements contained in more broadly scoped projects categorically satisfy the localized CO violations requirements of the Federal Clean Air Act as Amended, the EPA's Final Conformity Rule, and MTC Resolution 2270.

Exhibit 1 — Location Map of San Jose Area

Base map dated 6/91. Courtesy of the California State Automobile Association.

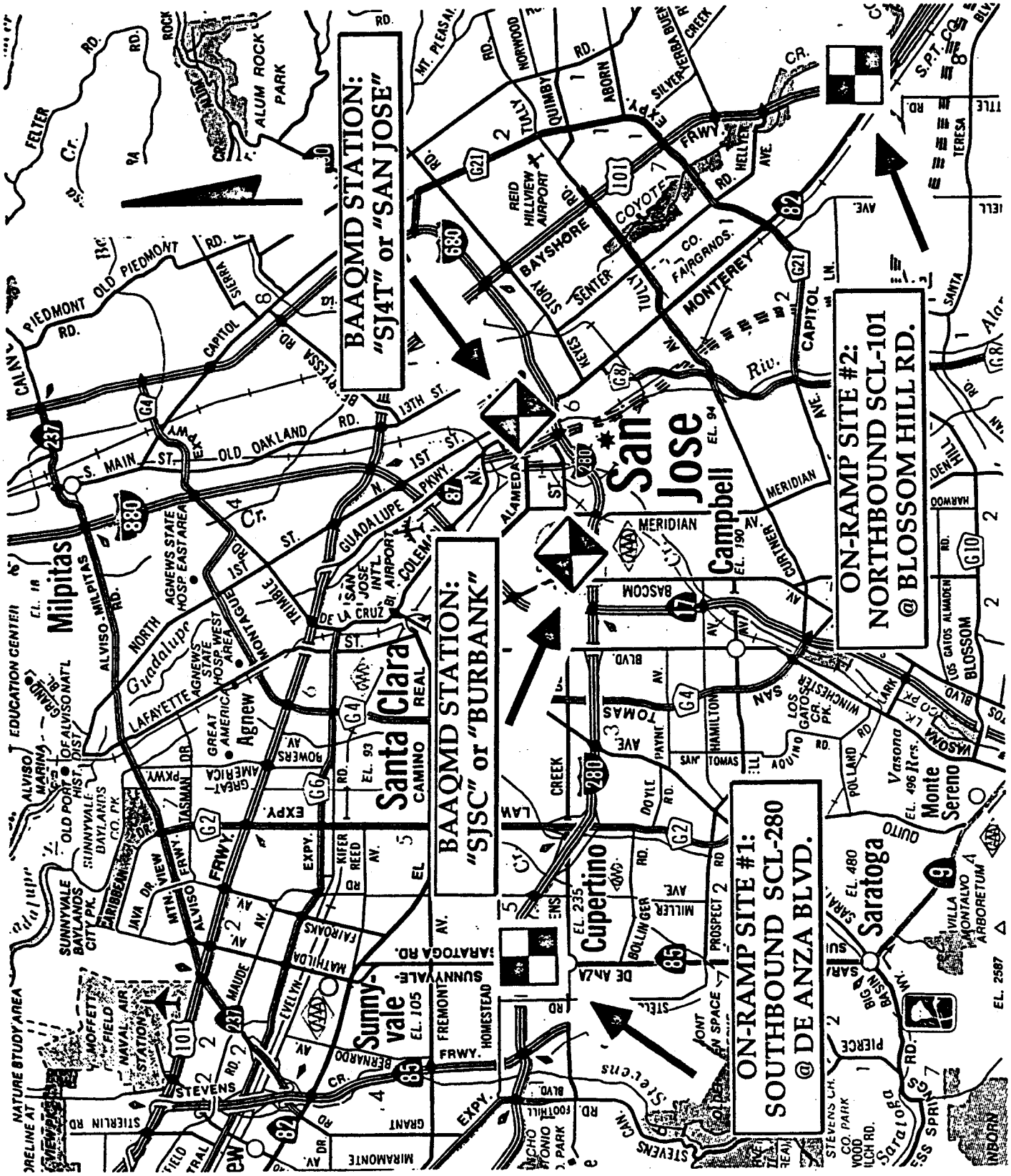


Exhibit 2 — Aerial Photo of SCL-280/De Anza Blvd. Site

Base photograph dated 5/21/92.
On-ramp metering and widening, and adjacent development have since been completed.

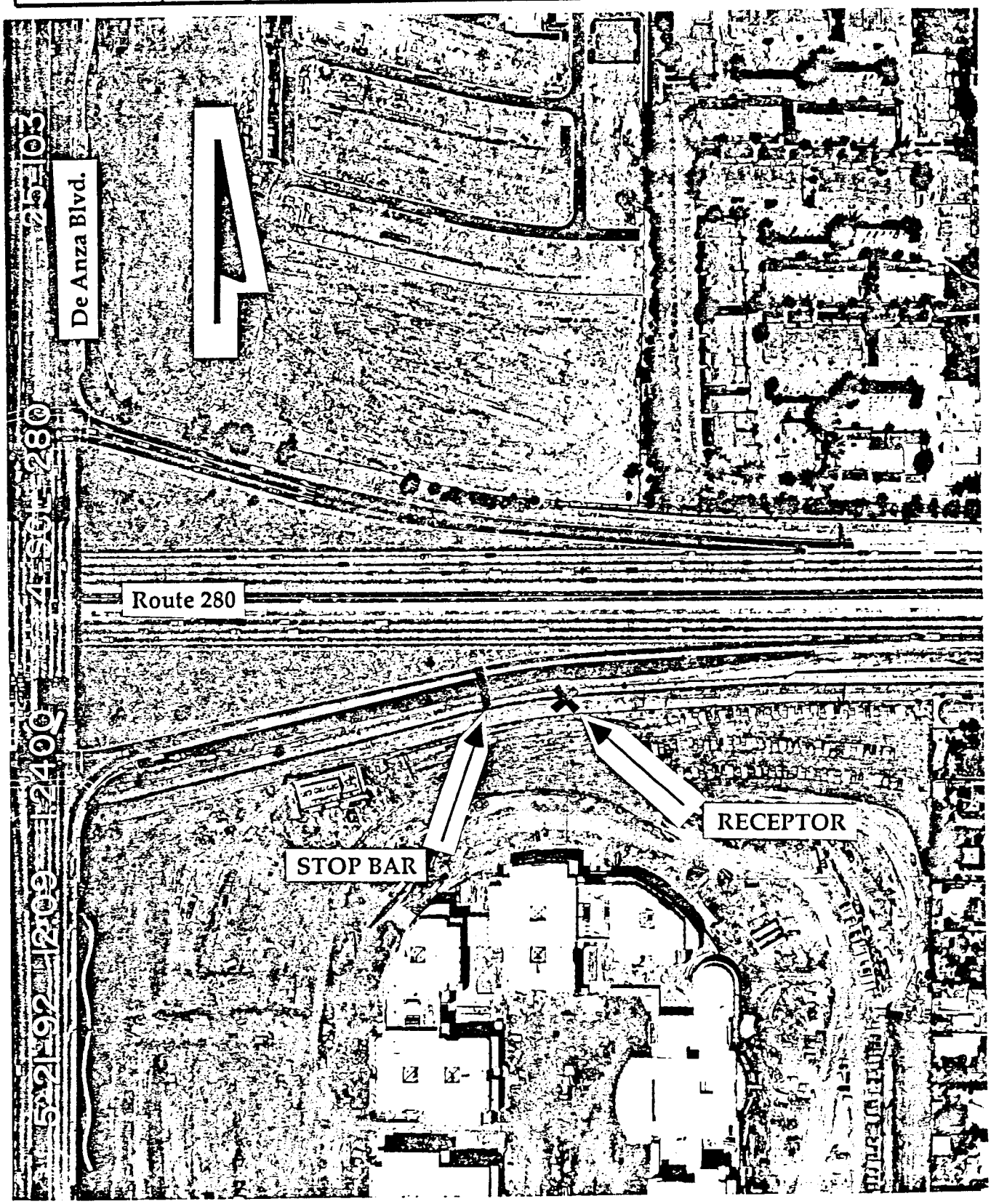


Exhibit 3 — Aerial Photo of SCL-101/Blossom Hill Rd. Site

Base photograph dated 3/6/91.
On-ramp metering and widening have since been completed.

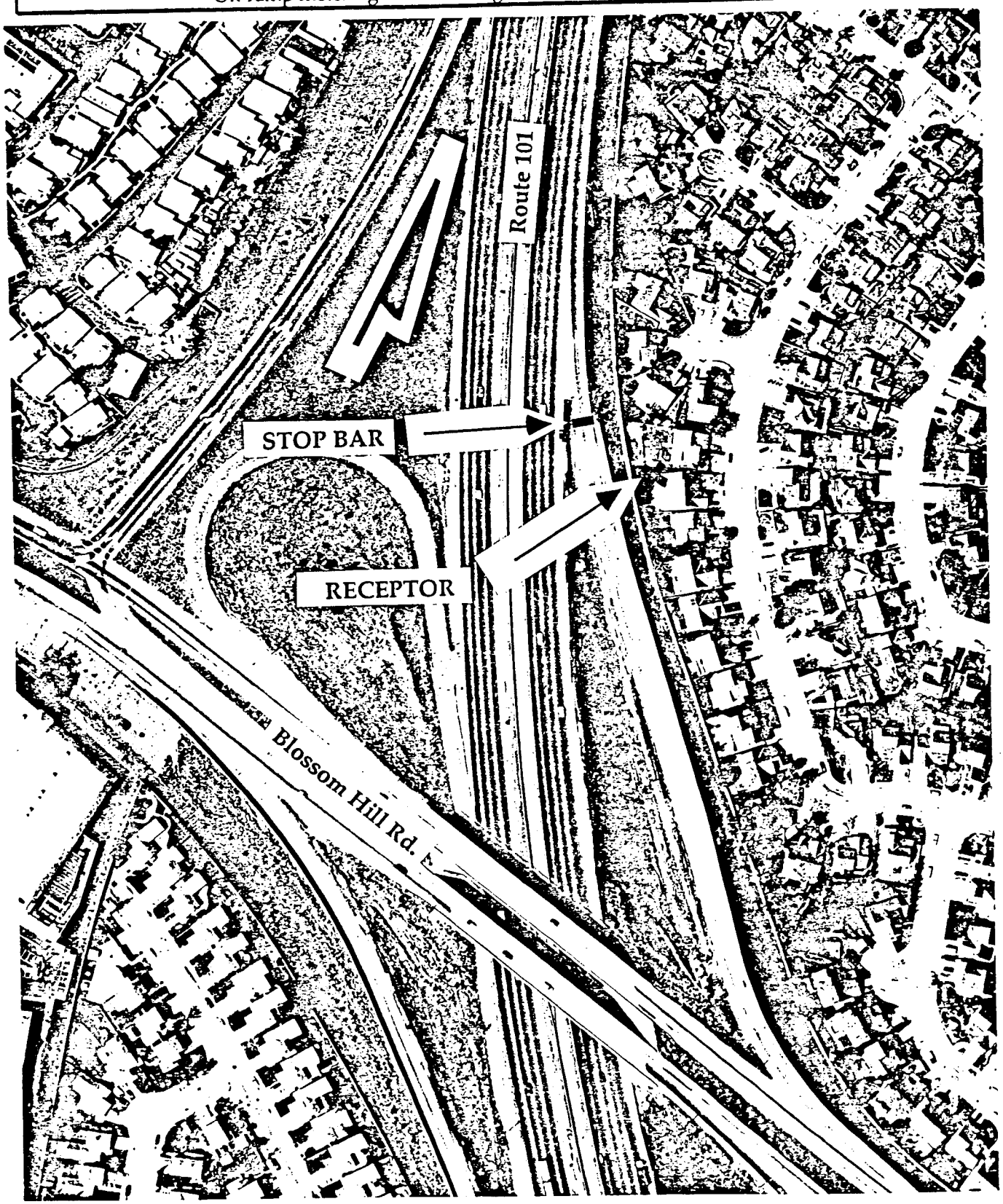
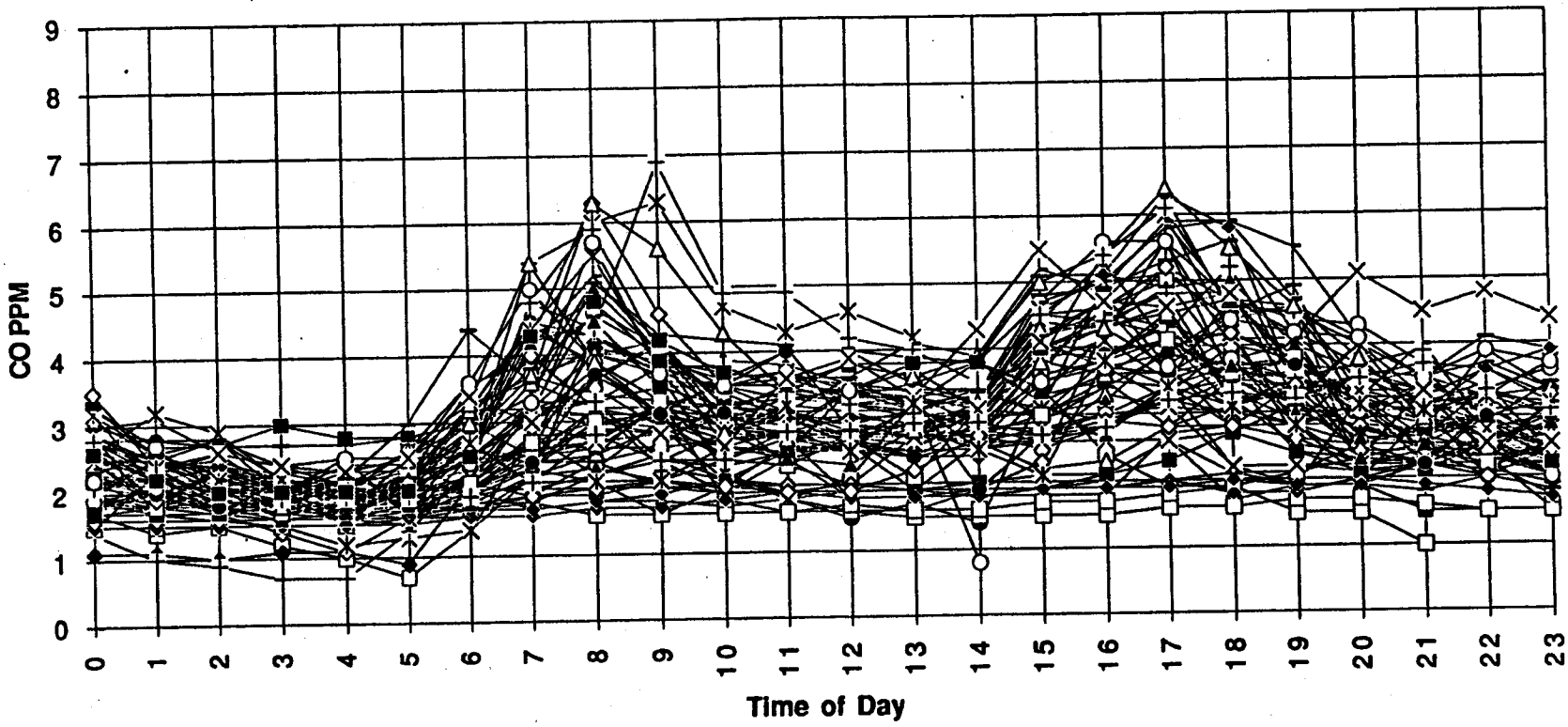


EXHIBIT 4

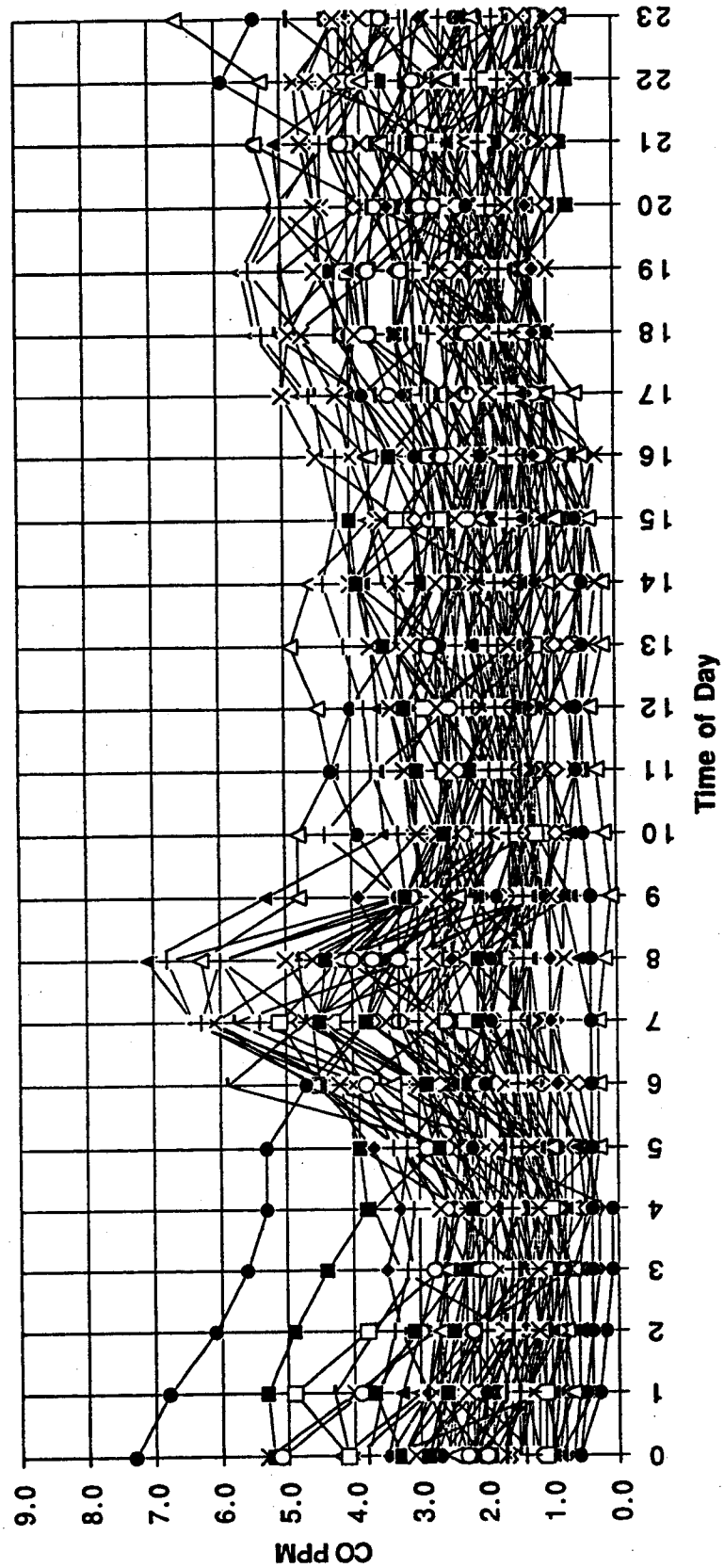
1-hr averages at De Anza / SB 280



101 1-hr

EXHIBIT 5

1-hr averages at Blossom Hill / NB 101



Dist 4 — Env. Eng.

EXHIBIT 6 - Carbon Monoxide Concentrations

@ Van Site (001) during January 1994

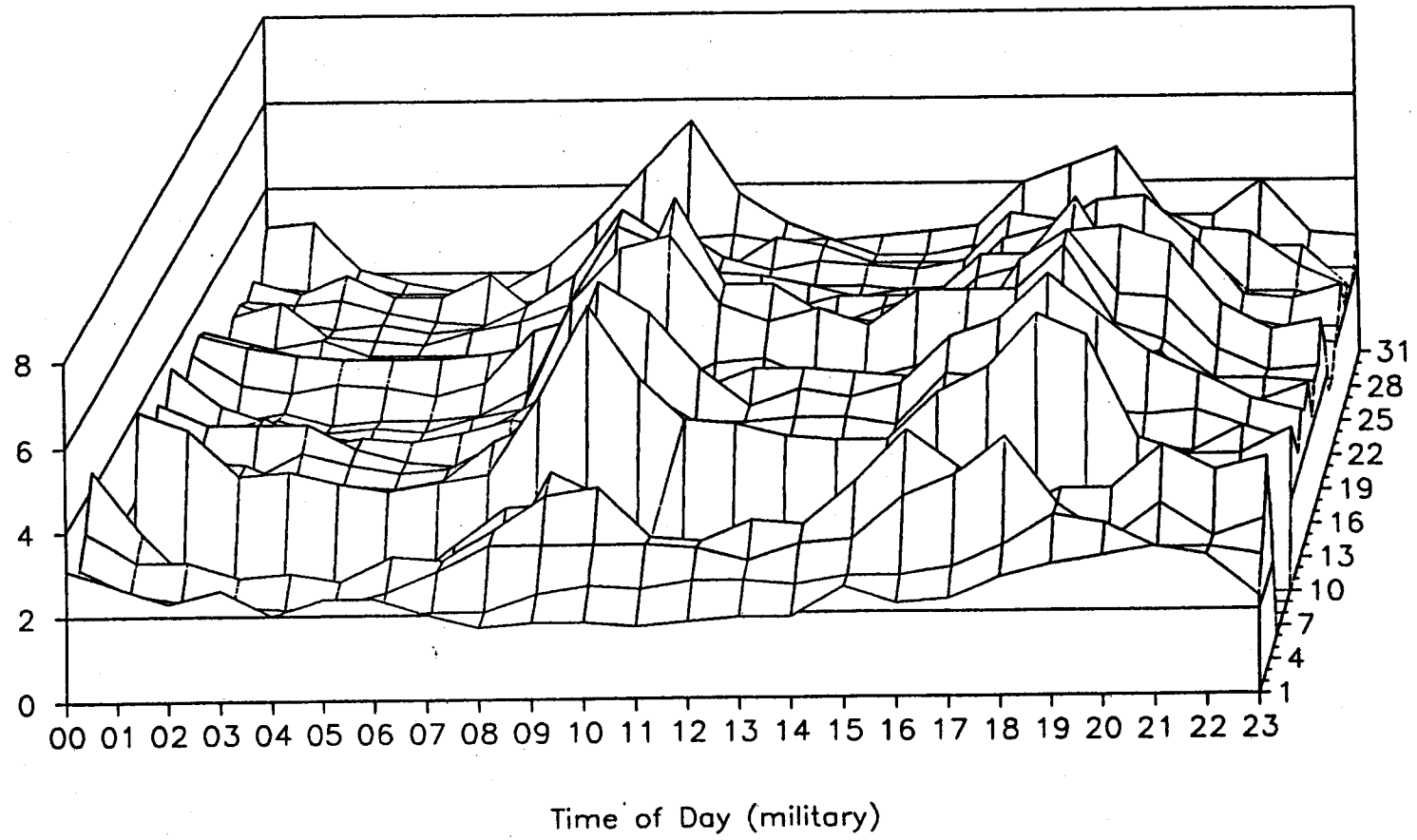


EXHIBIT 7-Carbon Monoxide Concentrations

@ Choi Site (002) during January 1994

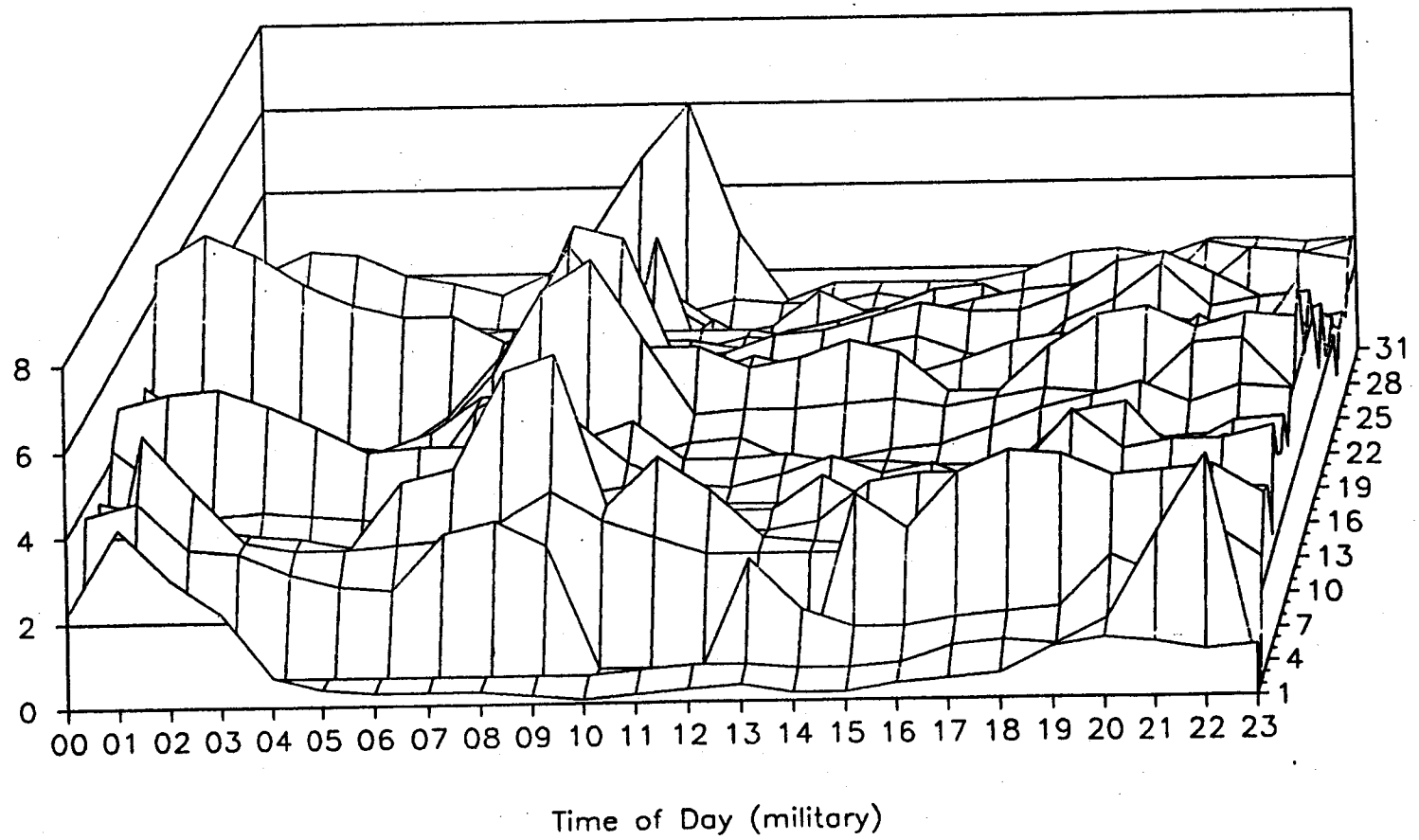


EXHIBIT 8

Daily max of 8-hr averages — Both Sites

(8-hr CO Standards: Fed = 9 ppm, CA = 9.0 ppm)

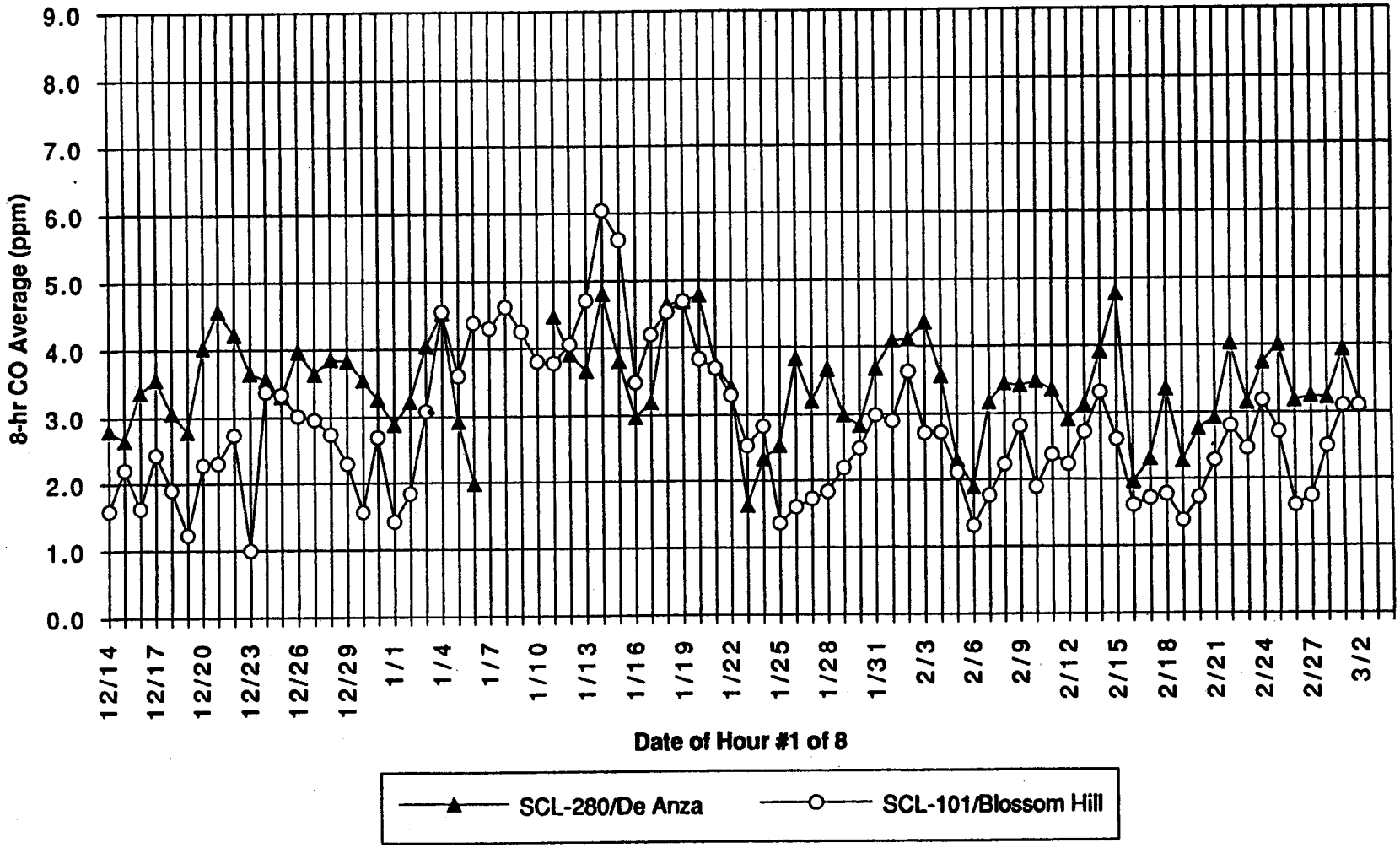


EXHIBIT 9

1-hr averages at De Anza / SB 280

Bold Line denotes days of 8-hour peaks

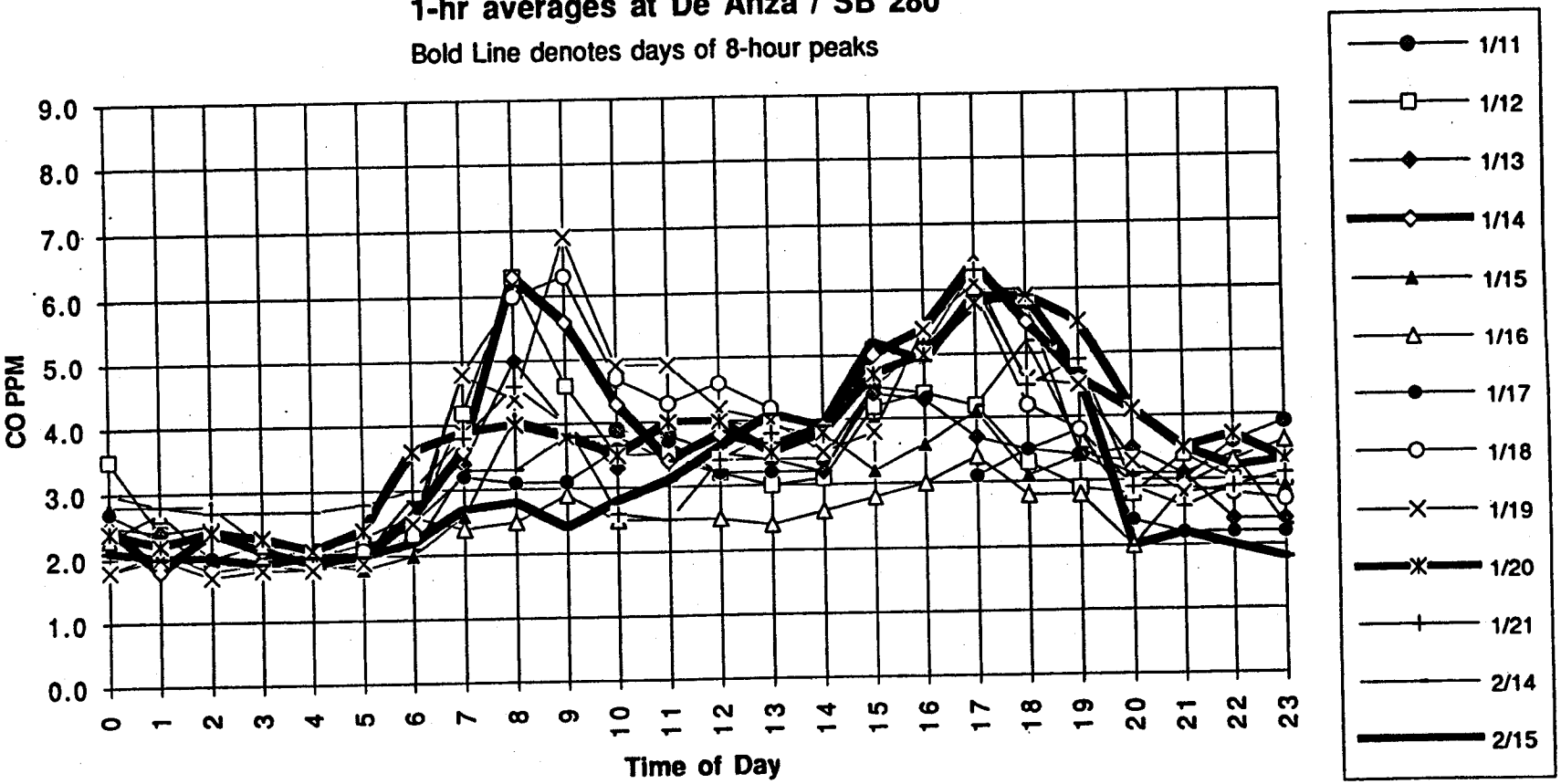


EXHIBIT 10

1-hr averages at Blossom Hill / NB 101

Bold Lines denote days contributing to 8-hour peak

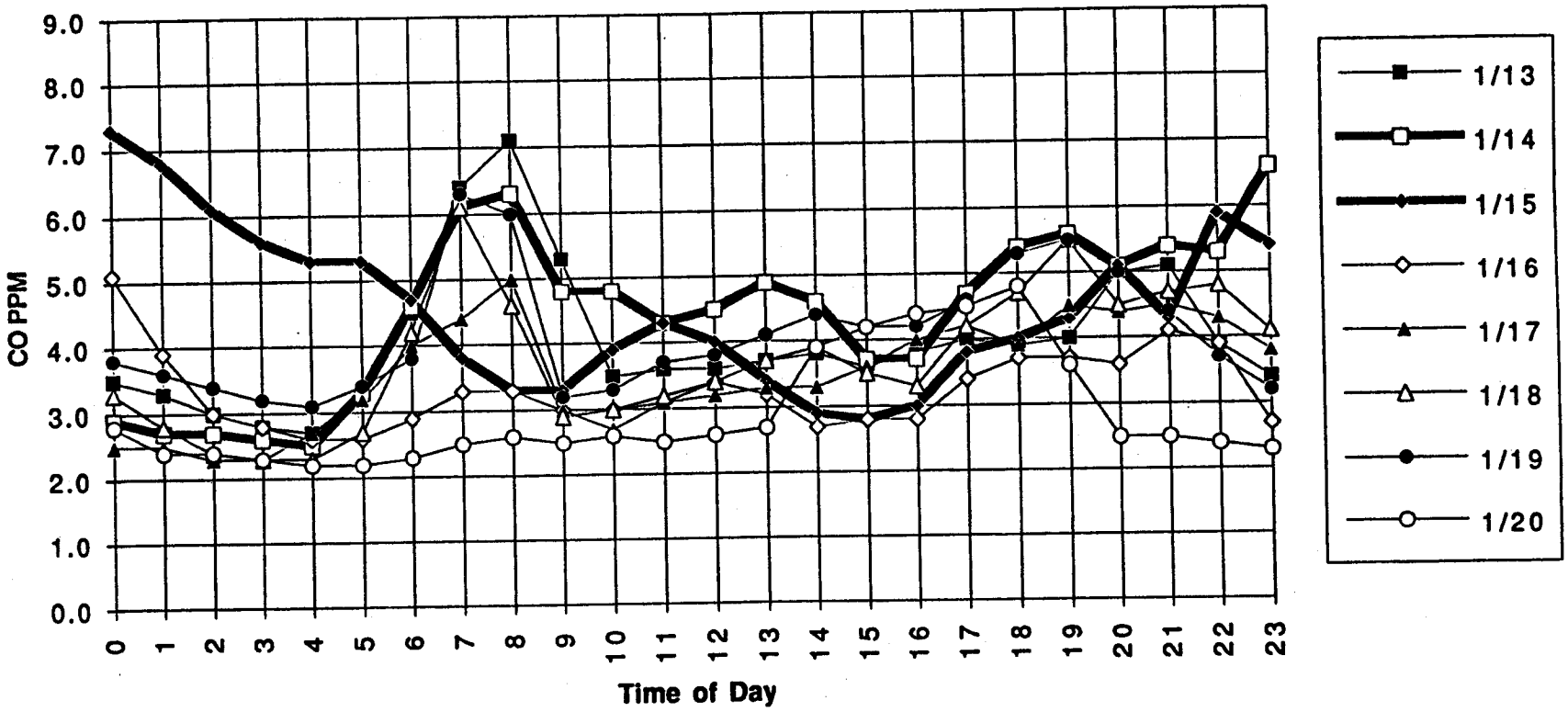
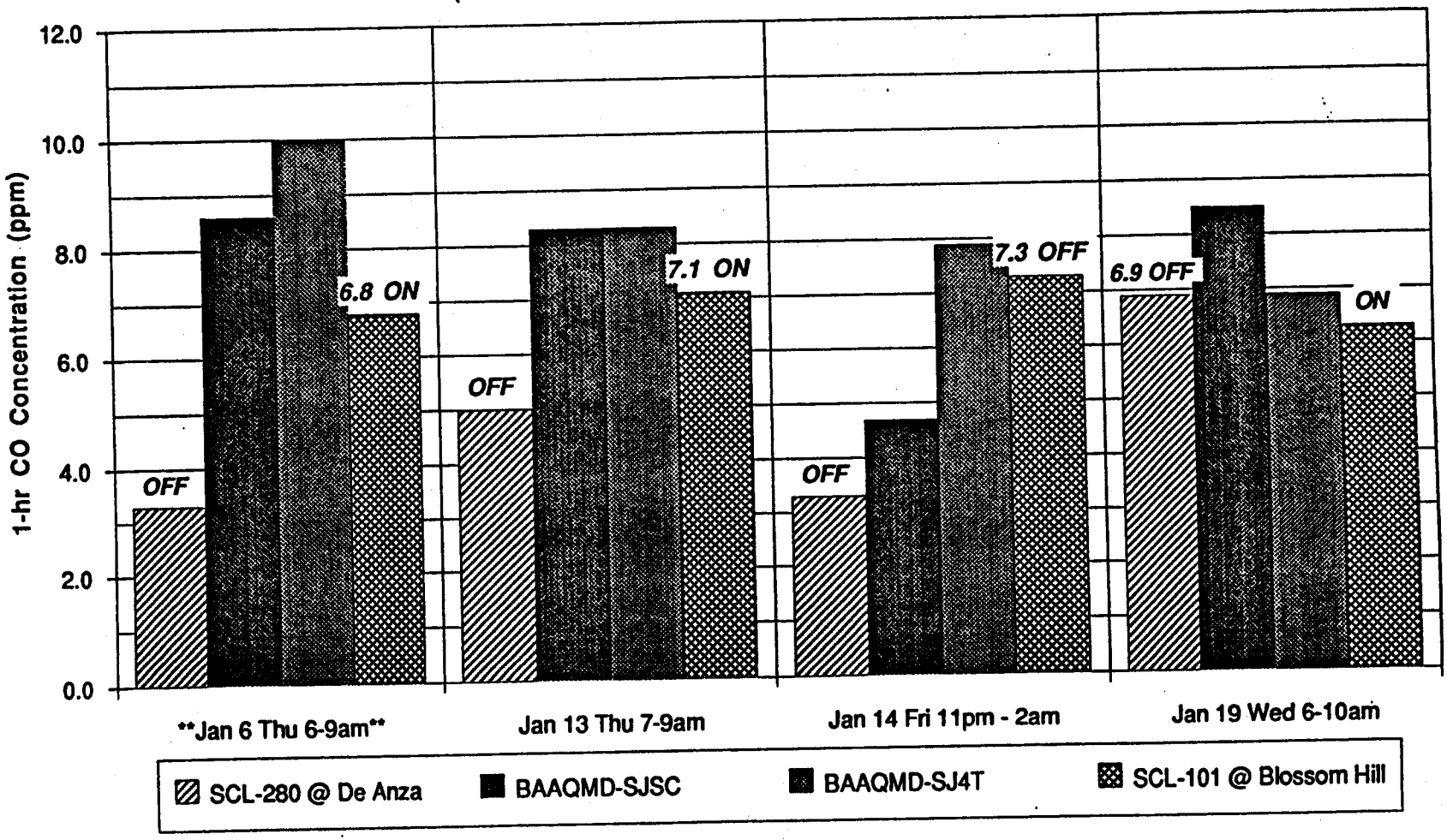


EXHIBIT 11

Four Highest On-Ramp Site Observations. (Corresponding Values Maximized Within ± 3 Hours. "On/Off" refers to Metering Status.)

(1-hr CO Standards: Fed = 35 ppm, CA = 20 ppm)



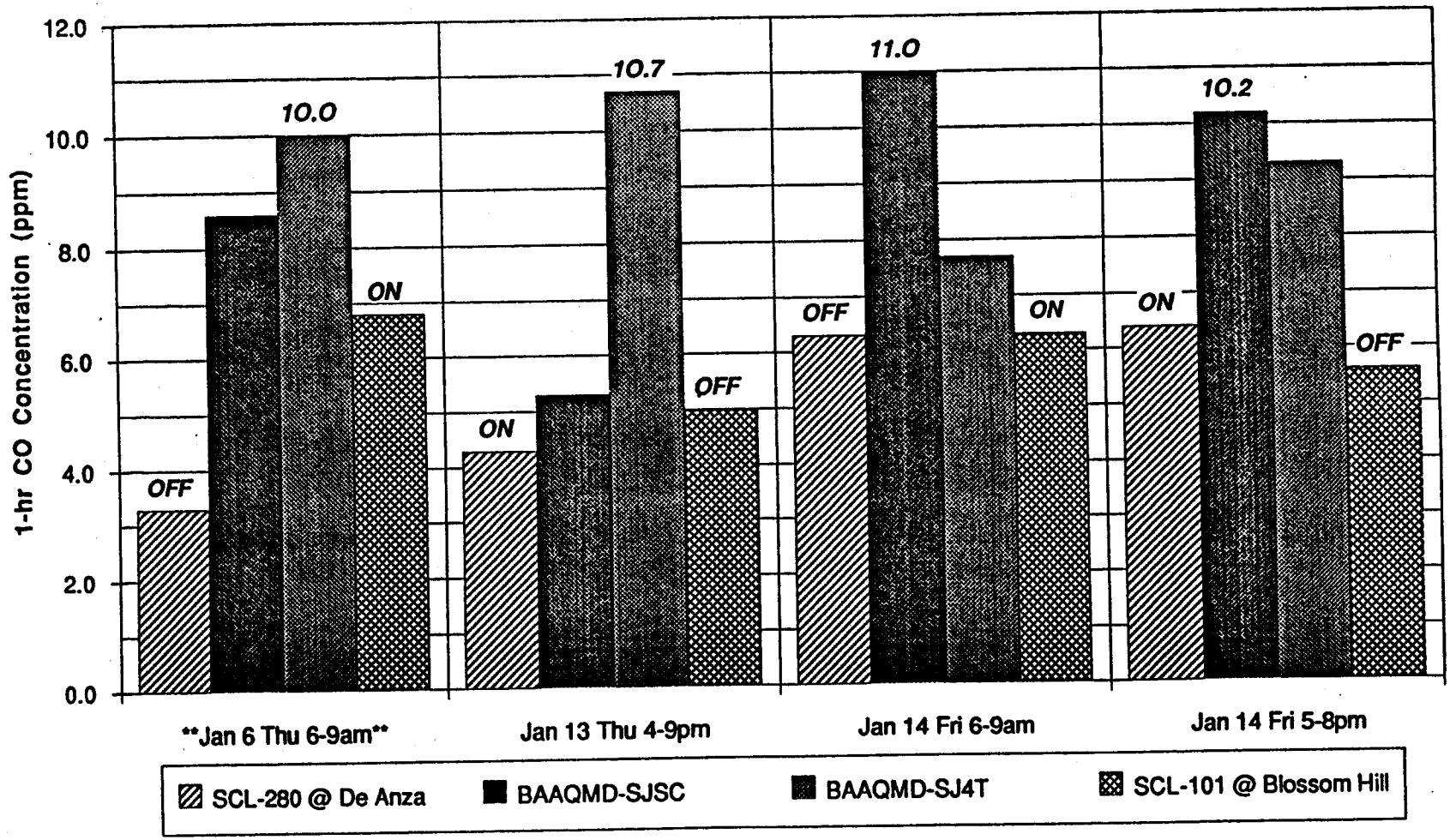
Dist 4 — Env. Eng.

5/11/94

EXHIBIT 12

Four Highest BAAQMD Station Readings. (Corresponding Values Maximized from Within ± 2 Hours. "On/Off" Refers to Metering Status.)

(1-hr CO Standards: Fed = 35 ppm, CA = 20 ppm)



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1. Bemis, G. R., et al, "Air Pollution and Roadway Location, Design, and Operation — Project Overview," Caltrans, FHWA/CA/TL/7080-77/25, September 1977.

2. Benson, P. E., et al, "Air Quality Technical Analysis Notes," Caltrans, June 1988.

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4. Deakin, Harvery, & Skabardonis, Inc., "Carbon Monoxide Transportation Project Protocol," Southern California Association of Governments (SCAG), December 1992.

5. Metropolitan Transportation Commission Staff, Resolution No. 2270, MTC, April 17, 1991.

6. Metropolitan Transportation Commission Staff, et al, "Project Sponsor Guidance and Checklist for Carbon Monoxide Analysis Performed for Conformity Assessment of Transportation Projects," MTC, revised March 1993.

7. Metropolitan Transportation Commission Staff, "Project Sponsor Guidance for CO Impact Assessments Required for Small Projects Per EPA/FHWA Interim Guidance," MTC, September 15, 1993.

8. Nokes, W. A., et al, "Carbon Monoxide Concentrations Adjacent to Sound Barriers," Caltrans, FHWA-CA-TL-84-04, March 1984

9. US EPA, Air Quality: Transportation Plans, Programs, and Projects; Federal or State Implementation Plan Conformity; Rule, US EPA, Federal Register, November 24, 1993

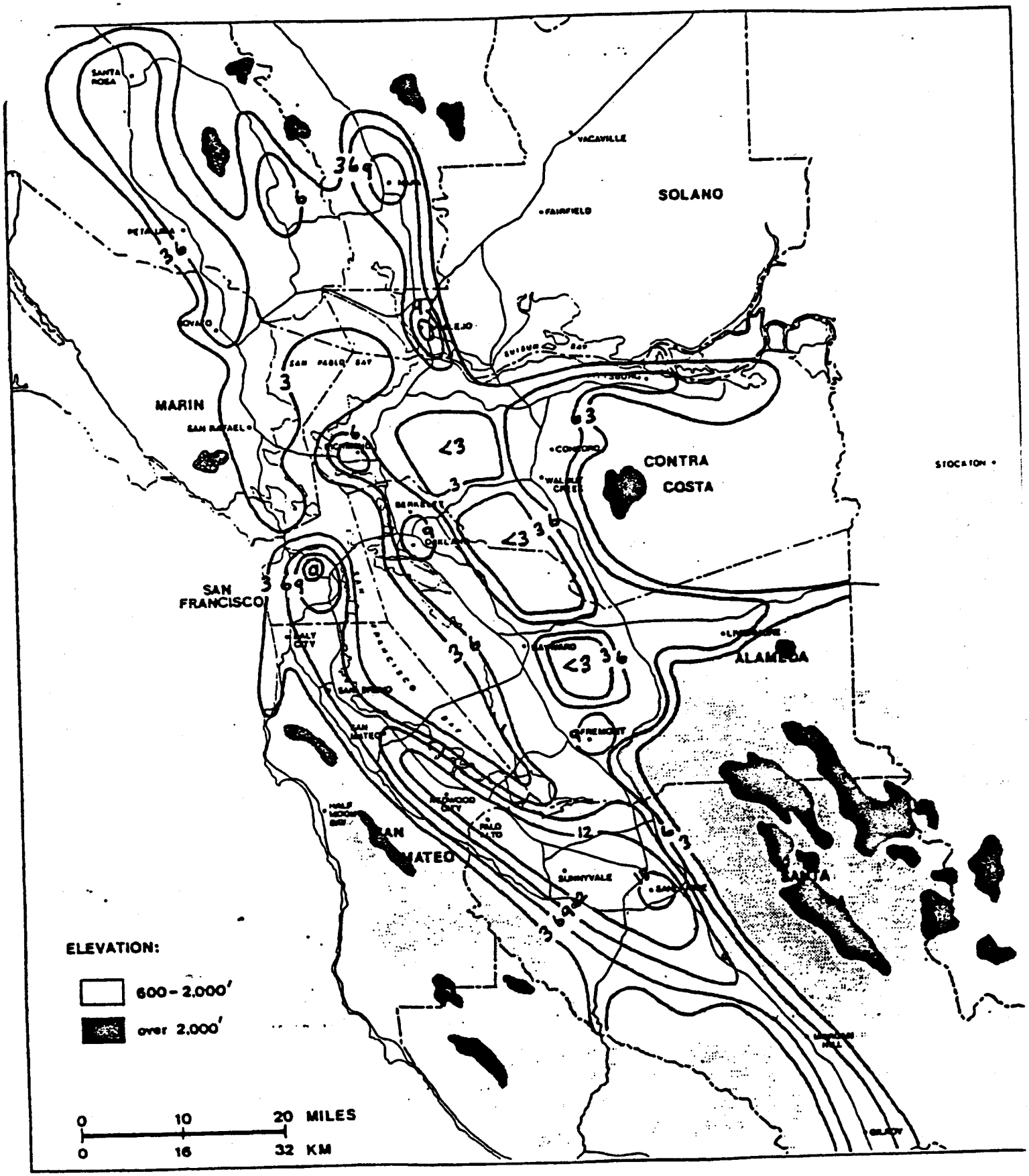
APPENDICES

Appendix A	Isopleth Maps and Rollback Factors
Appendix B	Equipment
Appendix C	Site Data — CO Concentrations
Appendix D	OBSMAX Analysis of Site Data
Appendix E	Site Data — Matched Wind Speed, Wind Direction, and CO Levels
Appendix F	BAAQMD Data — CO Concentrations
Appendix G	Site Data — Traffic
Appendix H	Flyer Inviting Public Participation
Appendix I	Permits To Enter
Appendix J	Thank-you Letter to Mr. Choe
Appendix K	MTC Letter to Caltrans, February 18, 1994
Appendix L	Photographs

Available for examination in the Caltrans District 4 Environmental Engineering Branch:

- Extensive unincorporated graphs and supporting data, hard copy and computerized
- Names and phone numbers of key contact people
- Photographs

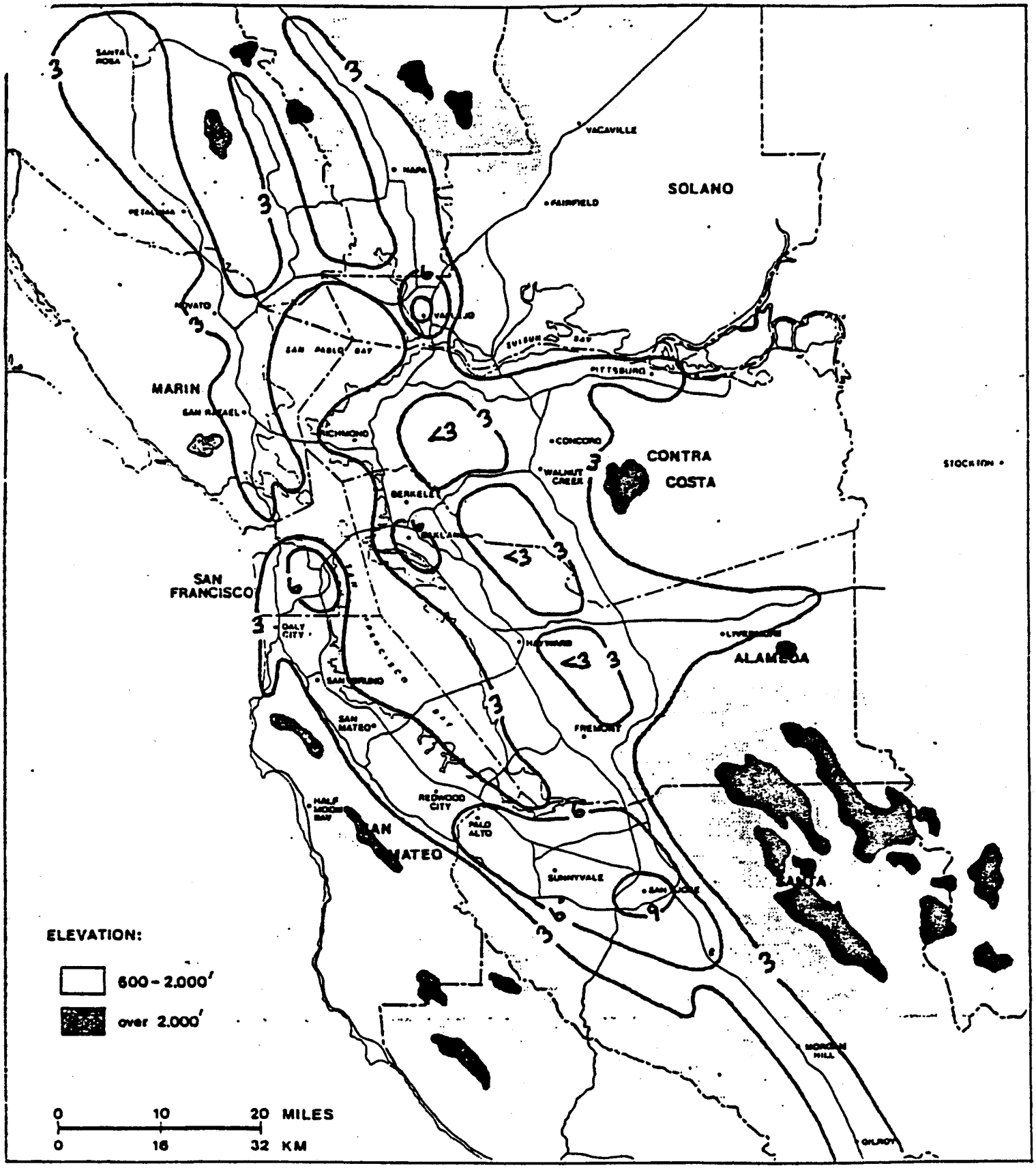
Figure V-B-4. Carbon Monoxide--One-Hour Background Values (ppm)--1989



Revised August 1991

A-1

Figure V-B-5. Carbon Monoxide--Eight-Hour Background Values (ppm)--1989



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After the 1989 carbon monoxide background concentration has been determined. estimates of any year to 2010 can be made using the factor in Table V-B-2. For the year desired, multiply the 1989 concentration times the appropriate factor.

TABLE V-B-2.

Fraction of aggregate CO 1989 emissions expected to be emitted from 1990 to 2010.*

Year	Fraction
1989	1.00
1990	.97
1991	.93
1992	.83
1993	.80
1994	.77
1995	.74
1996	.71
1997	.68
1998	.66
1999	.63
2000	.61
2001	.60
2002	.59
2003	.58
2004	.57
2005	.56
2006	.55
2007	.54
2008	.53
2009	.52
2010	.51

* Based on estimates of carbon monoxide emissions from seasonal (winter) emission inventories for the Bay Area.

EQUIPMENT

SCL-280/De Anza Blvd. Site

- Dasibi Environmental Corp. Model 3003
  Gas Filter Correlation CO Analyzer (manual calibration)
  US EPA designated reference method RFCA-0488-067, April 1988.
  Approved range 0 - 50 ppm. Accuracy ± 0.1 ppm.
- Dasibi Environmental Corp. Model 8003 Data Acquisition System
- Dasibi Environmental Corp. Model 8010 Data Pack Reader
- DeLonghi Type 3107 1500w oil-filled air heater
- Solomat Co. Model MPM 4000 MetLAB data acquisition system
- Solomat Co. Model 010WM Wind Monitor
  Range = 0.9 - 60.0 m/s (2.0 - 134.0 mph); Accuracy = ± 0.3 m/s (0.7 mph)
- #82 aluminum cylinder span gas, 46.0 ppm, for calibrating the Dasibi 3003.
- Electrical surge protector
- Tygon tubing

SCL-101/Blossom Hill Rd. Site

- Dasibi Environmental Corp. Model 3008 Serial No. 725
  Gas Filter Correlation CO Analyzer (automatic self-calibration)
  US EPA designated reference method RFCA-0488-067, April 1988.
  Approved range 0 - 50 ppm. Accuracy ± 0.1 ppm.
- Dasibi Environmental Corp. Model 8003 Data Acquisition System
- Dasibi Environmental Corp. Model 8010 Data Pack Reader
- DeLonghi Type 3107 1500w oil-filled air heater
- #82 aluminum cylinder span gas, 45.6 ppm, for calibrating the Dasibi 3008.
- Electrical surge protector
- Tygon tubing

Shared Equipment

- Epson NB3s IBM-compatible laptop computer
- Thermograph

Metered Ramp Carbon Monoxide Concentrations

Location: Cupertino @ Apple Corp. parking Lot
Site #: 001
Year: 1993
Month: December

CO and Ramp Meters

HOUR

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	N	MEAN
1																										
2																										
3																										
4																										
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6																										
7																										
8																										
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11																										
12																										
13																										
14													1.8	1.5	1.7	1.4	3.3	3.5	3.4	2.2	1.9	3.2	2.4	2.5	12.0	2.4
15	2.6	1.7	1.4	1.5	1.2	1.0	0.7	1.4	2.8	2.2	2.5	2.1	2.3	1.9	1.8	2.1	3.2	3.8	3.4	2.4	1.9	1.9	1.5	1.5	24.0	2.0
16	1.0	1.1	1.1	1.0	1.1	1.1	0.9	2.1	2.3	2.1	1.6	2.0	2.6	2.5	2.4	2.4	3.3	4.2	5.6	3.5	2.4	2.3	3.3	2.3	24.0	2.3
17	1.5	1.5	2.3	1.7	1.4	1.1	1.6	2.9	4.0	3.2	3.0	2.6	2.8	2.7	2.4	2.9	3.9	4.3	4.6	3.2	3.3	2.7	2.7	3.9	24.0	2.8
18	3.3	2.3	2.2	1.9	1.8	1.6	1.8	2.0	2.3	3.0	2.8	3.0	3.1	2.8	2.7	2.7	3.0	3.5	2.8	3.5	3.6	2.6	2.6	2.4	24.0	2.6
19	2.3	2.1	2.0	1.7	1.9	1.8	2.2	2.6	2.5	2.9	3.2	2.9	2.7	2.6	2.5	2.5	2.6	3.3	3.1	2.2	2.2	2.1	2.2	3.0	24.0	2.5
20	2.5	1.9	1.8	1.8	1.9	1.7	2.5	3.2	4.5	4.3	3.8	3.4	3.0	2.9	2.8	3.1	4.5	4.6	5.2	4.7	4.2	3.2	2.6	3.3	24.0	3.2
21	2.9	2.9	2.4	2.4	2.2	2.0	2.2	2.8	3.7	3.4	3.3	3.0	3.0	2.9	3.1	3.2	4.7	5.6	5.6	4.7	4.4	4.3	3.7	3.6	24.0	3.4
22	3.1	3.2	2.6	2.3	2.2	1.9	2.2	2.9	4.4	4.3	3.6	3.5	3.1	2.7	2.7	3.1	4.6	5.0	5.1	4.4	4.6	3.4	3.6	2.7	24.0	3.4
23	2.9	2.0	2.5	2.4	2.0	1.5	2.3	2.7	3.3	2.9	2.8	2.5	2.5	2.7	2.7	2.8	3.8	4.1	3.5	3.8	4.0	3.6	3.3	3.2	24.0	2.9
24	3.7	2.8	2.5	2.8	2.4	2.1	2.1	2.0	2.7	4.3	3.8	3.8	3.4	3.4	3.3	2.9	3.5	3.8	4.5	3.2	2.5	2.4	2.2	2.2	24.0	3.0
25	2.2	2.5	2.5	2.1	2.0	2.1	1.8	2.0	2.5	3.2	3.2	3.0	3.3	3.2	3.1	2.8	2.9	3.4	3.9	3.6	3.5	3.2	2.9	3.2	24.0	2.8
26	2.9	3.0	3.1	2.6	2.4	2.5	2.5	3.0	2.5	2.7	3.2	3.2	3.4	3.2	3.3	3.4	3.0	3.4	3.9	4.5	4.5	4.0	3.5	4.1	24.0	3.2
27	3.9	3.3	2.7	2.7	3.0	2.8	2.8	2.5	3.1	3.3	3.5	3.5	3.6	3.3	3.3	3.4	3.6	4.8	3.7	2.8	2.8	2.2	2.2	2.1	24.0	3.1
28	2.5	2.4	2.4	1.8	1.9	2.0	1.8	2.0	3.2	4.7	4.1	2.9	2.8	3.4	3.7	3.1	3.7	4.6	5.0	3.7	3.7	2.2	2.4	2.4	24.0	3.0
29	2.5	2.7	2.2	1.9	1.9	2.0	1.8	2.1	2.8	3.7	4.1	3.2	3.3	3.3	3.5	3.2	4.4	5.3	4.0	3.7	3.1	2.8	2.7	2.9	24.0	3.0
30	2.9	3.1	2.6	2.2	2.0	1.9	2.0	3.3	3.6	3.2	3.0	2.4	2.3	2.0	2.7	3.0	3.9	3.9	4.3	3.4	3.4	3.0	3.4	3.2	24.0	2.9
31	3.1	2.4	2.2	2.1	1.9	1.6	1.5	2.3	2.7	2.6	2.6	2.7	2.8	3.0	2.9	3.1	3.0	3.2	4.0	4.2	2.8	2.8	2.4	2.3	24.0	2.7
N	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	420	
MN	2.7	2.4	2.3	2.1	2.0	1.8	1.9	2.5	3.1	3.3	3.2	2.9	2.9	2.8	2.8	2.8	3.6	4.1	4.2	3.5	3.3	2.9	2.8	2.8	420	
MAX	3.9	3.3	3.1	2.8	3.0	2.8	2.8	3.3	4.5	4.7	4.1	3.8	3.6	3.4	3.7	3.4	4.7	5.6	5.6	4.7	4.6	4.3	3.7	4.1		5.6

Appendix C-1

Metered Ramp Carbon Monoxide Concentrations

Location: Cupertino @ Apple Corp. parking Lot
Site #: 001
Year: 1994
Month: January

HOUR

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	N	MEAN
1	3.1	2.7	2.3	2.6	2.0	2.4	2.4	2.0	1.7	1.8	1.8	1.7	1.8	1.9	1.9	2.6	2.2	2.3	2.8	3.1	3.3	3.5	3.3	2.3	24	2.4
2	2.1	1.9	1.9	1.9	1.7	1.6	1.7	1.8	1.8	2.2	2.4	2.3	2.5	2.5	2.4	2.6	2.6	2.8	3.3	4.0	3.8	3.2	3.2	3.0	24	2.5
3	2.6	2.0	1.8	1.7	1.6	1.7	2.0	2.5	3.1	3.1	3.1	3.1	3.0	2.7	3.1	3.2	4.2	4.7	5.6	4.0	3.1	4.0	3.2	3.6	24	3.0
4	3.2	2.5	2.5	2.1	2.2	2.0	2.6	2.5	3.2	4.0	4.2	3.0	2.9	3.4	3.3	4.3	5.5	4.6	3.6	4.1	4.1	5.1	4.5	4.8	24	3.5
5	4.4	2.9	1.7	1.6	1.5	1.2	1.3	1.4	2.2	4.3	3.7	2.2	1.8	1.6	1.6	1.9	2.7	3.0	3.1	3.0	2.8	3.0	3.3	2.5	24	2.4
6	2.0	1.4	1.0	0.9	0.7	0.7	1.4	2.3	3.2	3.3	2.4	1.9	-10.0	17.8	2.7	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	24	-2.4
7	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	24	-10.0
8	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	24	-10.0
9	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	24	-10.0
10	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	24	-10.0
11	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	3.9	3.8	3.5	3.4	3.4	4.5	5.1	6.3	5.8	3.4	3.0	3.0	3.6	24	-2.4
12	3.9	3.5	2.4	2.5	2.2	2.0	2.2	2.4	4.2	6.3	4.6	3.5	3.5	3.2	3.0	3.1	4.2	4.4	4.2	3.3	2.9	2.8	3.4	3.0	24	3.4
13	3.0	2.5	2.4	1.9	1.9	1.8	2.0	2.9	3.4	5.0	4.0	3.3	3.3	3.4	3.4	3.2	4.4	4.3	3.7	3.5	3.4	3.5	3.1	2.4	24	3.2
14	2.4	2.5	1.8	2.4	2.1	1.9	2.0	2.6	3.6	6.3	5.6	4.3	3.4	3.8	3.6	3.9	5.0	5.4	6.4	5.5	4.6	4.1	3.5	3.2	24	3.7
15	3.3	2.8	2.8	2.8	2.2	1.9	1.8	2.0	2.6	4.1	3.9	3.6	4.0	4.0	3.9	3.8	3.2	3.6	4.1	3.1	3.4	3.3	2.8	2.9	24	3.2
16	2.9	2.3	2.7	2.0	2.2	2.1	2.3	2.6	2.4	2.5	2.9	2.5	2.5	2.5	2.4	2.6	2.8	3.0	3.4	2.8	2.8	2.0	2.9	3.3	24	2.6
17	3.6	2.7	2.3	2.0	1.8	1.8	1.9	2.5	3.2	3.1	3.1	3.6	3.7	3.2	3.2	-10.0	3.9	-10.0	3.1	3.5	3.8	2.4	2.2	2.2	24	1.8
18	2.2	1.8	2.1	1.8	1.9	1.8	2.1	2.3	4.8	6.0	6.3	4.7	4.3	4.6	4.2	-10.0	-10.0	-1.2	6.0	4.2	3.8	2.9	2.9	2.8	24	2.2
19	2.7	1.8	2.0	1.7	1.8	1.8	1.9	2.5	4.8	4.4	6.9	4.9	4.9	4.2	4.0	3.5	3.8	5.4	6.1	4.6	4.5	3.3	2.8	2.9	24	3.6
20	3.1	2.4	2.2	2.4	2.3	2.1	2.4	3.6	3.9	4.0	3.8	3.5	4.0	4.0	3.5	3.8	4.7	5.0	5.8	5.9	5.5	4.1	3.5	3.7	24	3.7
21	3.3	3.0	2.8	2.7	2.7	2.7	2.8	3.0	3.8	4.6	4.0	2.6	2.5	3.4	3.8	-10.0	-10.0	-10.0	6.3	4.5	4.9	2.9	2.6	2.9	24	1.7
22	3.1	2.8	2.5	2.2	2.0	2.3	2.3	2.4	2.5	2.6	3.2	3.5	3.5	3.8	3.8	3.8	3.2	2.6	2.6	1.7	1.9	1.9	1.5	1.5	24	2.6
23	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.7	1.8	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.6	1.5	24	1.6
24	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	2.2	2.5	3.3	2.4	2.7	1.8	1.8	1.8	1.8	1.8	2.7	2.8	2.6	2.5	2.2	2.1	24	2.0
25	1.9	1.9	2.1	1.7	1.7	1.7	1.6	1.8	2.2	2.3	2.1	1.9	2.4	1.8	1.8	1.8	1.9	2.1	2.6	2.7	3.1	2.4	2.2	2.2	24	2.1
26	2.4	2.7	1.9	1.8	1.7	2.0	2.2	2.6	4.4	3.9	3.3	3.2	3.0	2.7	2.9	2.9	4.0	4.3	4.9	5.0	4.0	2.7	2.6	2.9	24	3.1
27	2.4	2.0	1.8	1.9	1.7	1.8	2.3	3.0	4.5	3.8	3.0	2.7	2.7	2.7	2.6	2.7	3.8	3.6	3.6	3.1	3.5	2.5	2.5	2.1	24	2.8
28	2.2	2.1	2.2	1.9	1.7	1.6	1.6	2.5	3.0	3.8	3.1	2.8	3.0	2.9	2.8	3.0	4.1	3.9	4.1	4.2	3.7	3.6	2.8	2.3	24	2.9
29	2.4	2.1	2.5	2.0	2.0	2.5	1.6	2.0	2.4	2.4	2.6	3.3	3.1	2.7	2.7	2.7	2.5	2.8	3.3	3.5	3.1	3.0	3.0	2.0	24	2.6
30	2.0	1.9	2.0	1.8	1.8	1.6	1.6	2.2	2.4	3.0	3.1	2.9	3.0	2.6	2.6	2.8	2.6	2.6	2.6	2.1	2.1	2.3	2.2	2.2	24	2.3
31	3.1	3.2	2.1	1.8	1.6	1.6	2.2	3.2	4.4	5.5	3.8	3.1	2.7	2.8	2.9	3.0	4.0	4.4	4.8	3.2	3.2	4.0	2.8	2.7	24	3.2
N	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	744	
MN	0.7	0.3	0.2	0.0	-0.1	-0.1	0.0	0.4	1.0	1.5	1.3	1.4	1.0	1.8	1.3	-0.4	0.4	0.4	1.8	1.4	1.3	1.0	0.8	0.7	744	
MAX	4.4	3.5	2.8	2.8	2.7	2.7	2.8	3.6	4.8	6.3	6.9	4.9	4.9	17.8	4.2	4.3	5.5	5.4	6.4	5.9	5.5	5.1	4.5	4.8		17.8

VANJAN.WK4

Metered Ramp Carbon Monoxide Concentrations

Location: Cupertino @ Apple Corp. parking Lot
Site #: 001
Year: 1994
Month: February

HOUR

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	N	MEAN
1	2.4	2.2	2.2	2.1	1.8	2.2	2.2	2.5	5.4	5.9	4.0	3.5	3.3	3.4	3.1	3.4	4.2	4.5	4.8	4.8	3.5	3.7	3.9	2.8	24	3.4
2	2.2	2.2	2.0	2.3	2.1	1.9	2.1	2.6	4.1	5.2	4.0	3.5	3.6	3.5	3.2	3.3	3.1	4.9	5.9	4.7	3.8	3.2	4.0	2.7	24	3.3
3	2.7	2.3	2.2	2.4	2.1	2.0	1.9	2.2	3.1	5.1	4.2	3.7	3.6	3.6	3.1	3.3	4.8	4.9	5.3	5.6	4.2	3.7	3.1	2.8	24	3.4
4	2.4	2.1	2.5	2.1	2.3	2.3	2.5	2.5	3.0	3.6	4.2	3.2	3.1	3.1	3.1	3.3	4.0	3.8	4.4	3.8	2.8	2.5	2.7	2.6	24	3.0
5	2.6	2.5	2.3	2.0	2.0	1.7	2.1	2.0	2.6	2.7	3.3	1.8	1.6	1.7	1.6	1.6	1.7	1.7	1.8	1.9	2.1	2.5	2.2	2.2	24	2.1
6	1.7	1.7	1.8	2.1	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.8	1.9	1.9	1.9	1.8	1.9	2.0	2.0	1.8	1.8	2.0	1.9	1.8	24	1.8
7	1.7	1.6	1.6	1.6	1.6	1.6	2.1	3.2	3.2	3.5	2.9	2.1	2.0	2.0	1.9	1.9	2.3	4.3	5.2	4.2	2.6	2.2	2.3	2.3	24	2.5
8	2.3	1.9	1.7	1.7	1.6	1.6	2.2	3.5	4.2	4.5	3.5	3.2	3.1	2.9	2.8	2.7	3.6	3.8	4.1	3.5	3.0	2.6	2.5	2.3	24	2.9
9	2.0	1.9	2.0	1.8	1.7	1.7	1.9	3.2	3.7	4.0	3.7	2.8	2.7	2.5	2.5	3.1	4.1	3.7	3.2	3.7	3.8	3.0	2.8	2.6	24	2.8
10	2.0	1.8	1.8	1.8	1.7	1.7	1.7	1.9	2.3	3.2	2.3	2.1	2.5	2.6	2.4	2.9	3.5	3.7	3.9	3.7	3.5	3.3	3.1	3.2	24	2.6
11	2.5	1.9	1.8	2.1	1.9	2.0	2.6	3.6	5.0	3.9	3.1	2.8	2.8	2.8	2.7	2.6	3.5	3.7	3.6	3.8	3.5	3.0	3.2	2.4	24	3.0
12	2.0	2.2	1.8	1.7	2.2	2.1	1.9	2.1	2.8	2.8	3.1	2.8	3.1	2.9	2.7	2.8	2.8	2.8	3.4	2.2	2.2	2.2	2.2	2.6	24	2.5
13	2.7	2.6	3.2	2.9	2.2	1.9	1.9	2.0	2.0	2.2	2.4	2.8	3.2	3.1	2.8	2.9	3.1	2.9	3.2	3.0	2.8	3.6	3.5	2.7	24	2.7
14	2.3	2.1	2.0	1.9	1.9	2.2	2.0	2.1	3.3	3.3	3.8	3.8	3.4	3.2	3.2	3.2	4.5	4.4	4.2	5.2	3.5	3.1	3.1	3.4	24	3.1
15	2.3	2.1	2.0	2.0	1.9	2.0	2.0	2.2	2.7	2.8	2.4	2.8	3.1	3.6	4.1	3.9	5.2	4.9	5.9	5.9	4.7	2.0	2.2	2.0	24	3.1
16	1.8	1.8	2.0	2.0	2.1	1.8	1.8	1.7	1.9	2.4	2.0	1.9	1.9	2.0	1.9	1.8	1.9	1.9	2.0	2.1	1.9	1.9	1.8	2.0	24	1.9
17	1.8	1.7	1.7	1.7	1.8	1.7	1.7	2.1	1.9	1.9	2.1	2.6	2.4	2.6	1.9	2.0	2.1	2.1	2.3	2.7	2.4	2.1	2.1	2.5	24	2.1
18	2.2	2.2	1.8	1.8	1.7	1.8	1.9	2.1	2.7	3.0	2.9	3.1	2.3	2.7	2.1	3.1	3.0	3.8	4.1	3.6	3.8	3.1	2.4	2.2	24	2.6
19	2.5	2.3	2.0	1.9	1.8	1.7	1.7	1.7	1.7	1.8	1.9	2.1	1.9	1.8	1.8	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.2	2.5	24	1.9
20	2.9	2.5	1.9	2.3	2.0	1.9	1.8	1.8	1.9	2.0	2.1	2.0	1.9	1.9	2.2	2.7	2.7	2.9	2.8	2.8	3.4	2.4	2.4	2.0	24	2.3
21	2.4	2.2	2.1	1.9	1.8	1.7	1.8	1.8	2.2	2.3	3.0	2.8	2.4	2.3	2.8	2.5	2.7	2.7	3.4	3.7	3.3	2.3	2.5	2.5	24	2.5
22	2.8	2.9	2.5	2.3	1.8	2.1	2.6	3.3	5.4	3.9	3.1	2.8	2.7	2.7	2.8	3.2	4.3	4.3	4.5	4.7	4.6	3.8	2.9	2.6	24	3.3
23	2.5	2.3	2.0	1.8	1.9	1.8	2.0	2.5	2.4	3.7	3.1	3.1	3.5	3.4	3.3	1.9	-10.0	-4.2	3.5	4.7	3.7	3.1	3.2	2.9	24	2.0
24	2.9	2.2	2.1	2.1	2.0	2.0	2.1	2.4	3.3	5.7	3.7	3.5	3.7	3.4	3.2	0.8	-10.0	-5.7	3.7	4.4	4.2	4.1	3.5	3.9	24	2.2
25	3.7	2.5	2.4	2.6	2.4	2.3	2.5	3.4	3.0	2.7	2.8	2.6	3.6	3.9	3.3	3.1	4.1	4.7	4.6	4.8	3.2	3.3	3.3	2.5	24	3.2
26	2.5	2.8	2.4	2.2	2.0	1.9	1.9	2.7	2.1	2.1	2.1	2.4	2.8	2.5	3.2	2.5	2.1	3.8	3.4	3.1	2.8	3.1	3.0	3.2	24	2.6
27	3.1	2.8	2.3	2.0	1.9	1.9	1.9	1.9	2.1	2.8	2.4	2.4	2.8	2.8	2.9	2.9	2.7	2.8	3.2	3.3	3.2	3.5	3.7	3.3	24	2.7
28	3.0	2.4	2.2	2.2	2.1	2.1	2.2	2.6	3.6	4.1	3.9	3.4	3.0	3.0	-3.0	-9.7	4.2	4.5	4.3	-2.1	4.1	2.7	2.5	2.9	24	2.1
N	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	672	
MN	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.8	1.6	1.7	-3.0	-9.7	-10.0	-5.7	1.8	-2.1	1.8	1.9	1.8	1.8	672	
MAX	3.7	2.9	3.2	2.9	2.4	2.3	2.6	3.6	5.4	5.9	4.2	3.8	3.7	3.9	4.1	3.9	5.2	4.9	5.9	5.9	4.7	4.1	4.0	3.9		5.9

CO and Ramp Meters

Appendix C-3

VANFEB.WK4

Metered Ramp Carbon Monoxide Concentrations

Location: Cupertino @ Apple Corp. parking Lot
Site #: 001
Year: 1994
Month: March

CO and Ramp Meters

HOUR

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	N	MEAN
1	3.1	3.3	2.6	2.8	2.0	2.2	3.0	4.4	3.6	5.1	4.3	4.2	4.1	2.8	-10.0	3.8	5.1	5.1	4.9	-2.1	3.1	2.7	2.7	2.8	24	2.7
2	3.4	2.6	2.2	2.0	2.0	2.0	2.0	2.5	4.3	4.8	3.9	3.7	-10.0												13	2.0
3																										
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30																										
31																										
N	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	37	
MN	3.1	2.6	2.2	2.0	2.0	2.0	2.0	2.5	3.6	4.8	3.9	3.7	-10.0	2.8	-10.0	3.8	5.1	5.1	4.9	-2.1	3.1	2.7	2.7	2.8	37	
MAX	3.4	3.3	2.6	2.8	2	2.2	3	4.4	4.3	5.1	4.3	4.2	4.1	2.8	-10	3.8	5.1	5.1	4.9	-2.1	3.1	2.7	2.7	2.8		5.1

Appendix C-4

Metered Ramp Carbon Monoxide Concentrations

Location: San Jose @ Mr. Choi's Residence
Site #: 002
Year: 1993
Month: December

HOUR

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	N	MEAN
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										
13													0.5	0.5	0.5	0.6	0.6	0.3	1.5	1.2	1.4	0.7	0.8	0.7	12	0.8
14													1.3	1.0	0.6	0.6	0.8	1.0	1.4	1.9	1.8	2.5	2.5	1.9	24	1.7
15	1.1	1.8	1.4	1.0	1.2	1.1	2.3	2.9	4.3	3.3	1.1	1.4	1.3	0.7	0.9	1.2	1.2	1.3	1.1	1.8	1.7	2.0	2.8	1.2	24	1.0
16	1.5	0.9	0.4	0.4	0.3	0.3	0.5	0.8	0.9	0.8	0.8	0.7	0.6	2.1	2.2	2.3	1.8	1.2	1.0	1.9	1.6	1.7	1.5	1.5	24	1.6
17	1.1	0.8	0.8	0.9	0.9	0.9	1.2	2.9	4.8	2.4	1.3	1.5	2.1	1.5	1.2	0.9	0.8	0.9	1.2	1.6	1.6	1.2	1.4	1.0	24	1:4
18	1.2	0.9	1.1	0.7	0.8	1.3	1.1	2.5	3.3	2.2	0.7	1.2	1.5	1.0	1.0	1.1	0.8	0.7	0.7	1.0	1.0	1.4	1.0	1.6	24	1.2
19	2.9	3.5	1.1	0.8	0.8	0.7	0.7	0.9	1.4	1.4	1.1	0.8	1.0	1.0	1.1	0.8	0.7	0.7	1.0	1.5	1.2	1.6	1.5	1.3	24	1.2
20	0.8	0.6	0.3	0.2	0.1	0.1	2.1	2.6	1.9	1.7	1.6	1.5	1.7	2.0	1.7	1.2	0.7	0.7	1.0	1.5	1.2	1.6	1.5	1.3	24	1.6
21	1.3	2.1	2.8	2.7	2.6	2.5	2.0	2.3	1.5	1.6	1.5	1.6	1.3	1.3	1.0	0.5	0.4	0.8	1.1	1.1	1.3	2.0	1.7	1.2	24	1.6
22	1.2	1.6	1.8	2.3	1.3	1.4	1.6	4.5	3.8	3.6	2.1	2.2	1.9	2.2	1.1	0.8	0.5	0.8	1.5	1.7	1.7	1.6	1.5	1.2	24	1.8
23	0.9	1.5	1.4	0.9	0.9	0.8	0.8	0.7	1.0	0.8	1.0	0.9	0.6	0.5	0.4	0.3	0.4	0.3	1.0	1.0	1.0	1.9		1.8	23	0.9
24	0.9	0.7	0.6	0.6	0.6	0.5	0.6	1.1	1.3	2.2	2.7	1.9	1.8	2.2	2.0	1.7	1.5	1.6	2.0	2.1	2.3	2.2	2.9	2.4	24	1.6
25	2.9	4.1	4.3	3.7	3.1	3.3	3.2	2.5	2.6	2.6	2.8	2.5	2.2	1.9	2.2	2.3	2.1	1.9	2.0	2.0	1.7	2.2	2.8	4.2	24	2.7
26	3.2	2.2	1.2	1.7	3.3	3.7	2.8	3.0	2.9	3.3	2.7	2.5	2.6	2.9	2.7	2.3	2.0	1.9	2.5	2.5	3.0	2.7	3.3	3.1	24	2.7
27	3.2	2.5	2.9	2.0	1.5	2.5	2.9	2.5	3.8	3.5	2.1	2.4	2.1	1.8	2.9	2.5	2.4	2.4	2.7	3.2	3.1	3.3	3.6	3.0	24	2.7
28	1.5	1.8	1.4	1.1	0.7	1.0	1.6	1.8	3.2	3.1	1.3	1.1	1.2	1.6	1.9	1.8	2.3	2.1	2.5	3.7	3.8	2.8	2.6	2.2	24	2.0
29	1.6	1.2	1.4	1.4	1.3	1.6	1.4	2.7	2.8	2.4	2.0	2.3	1.9	2.7	1.6	1.8	2.1	1.9	2.2	2.4	2.0	2.5	2.1	1.8	24	2.0
30	1.0	1.3	2.2	1.6	1.0	0.5	0.4	0.6	2.5	2.8	2.2	1.8	1.0	1.0	0.7	0.5	0.5	1.0	1.4	1.7	1.6	1.6	1.3	1.1	24	1.3
31	1.1	1.7	1.6	1.5	1.4	1.2	0.4	0.4	0.4	0.6	0.8	0.7	1.0	1.0	1.4	1.2	1.1	1.4	1.6	2.8	2.5	2.3	2.6	2.0	24	1.4

N	17	17	17	17	17	17	17	17	17	17	17	17	18	18	18	18	18	18	18	18	18	18	17	18	419	
MN	1.6	1.7	1.6	1.4	1.3	1.4	1.5	2.0	2.5	2.3	1.6	1.6	1.5	1.5	1.4	1.3	1.2	1.2	1.7	1.9	1.9	2.0	2.1	1.9	419	
MAX	3.2	4.1	4.3	3.7	3.3	3.7	3.2	4.5	4.8	3.6	2.8	2.5	2.6	2.9	2.9	2.5	2.4	2.4	2.7	3.7	3.8	3.3	3.6	4.2		4.8

SJDEC.WK4

Metered Ramp Carbon Monoxide Concentrations

Location: San Jose @Mr. Choi's Residence
Site #: 002
Year: 1994
Month: January

HOUR

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	N	MEAN
1	2.2	4.2	3.0	2.2	0.7	0.4	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.4	0.2	0.2	0.4	0.5	0.6	1.2	1.4	1.3	1.1	1.2	24	1.0
2	1.3	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.5	0.6	1.0	1.1	1.0	1.6	3.6	5.4		23	1.0
3														2.8	1.6	1.2	1.2	1.4	1.5	1.6	2.8	2.3	3.5	2.7	11	2.1
4	3.7	4.0	2.9	2.8	2.3	2.0	1.9	3.2	3.5	2.9						4.0	3.2	4.5	5.0	4.9	4.4	4.5	4.6	3.9	19	3.6
5		5.3	4.0	2.8	2.6	2.6	2.7	2.8	3.2	3.9	3.2	2.8	2.4	2.4	2.4	2.4	2.7	2.8	3.1	3.8	3.9	3.8	3.8	3.8	23	3.2
6	3.5	3.2	2.9	2.7	2.6	2.4	3.9	4.2	6.4	6.8	3.3	4.4	3.6	2.5	2.4	2.3	2.5	2.8	3.0	3.3	3.2	3.6	3.3	2.4	24	3.4
7	2.3	2.1	2.0	2.0	1.9	1.9	2.4	3.6	5.8	3.1	2.6	2.3	2.4	2.4	2.6	3.5	3.7	3.7	3.8	5.1	4.2	4.4	4.4	4.7	24	3.2
8	4.2	3.3	2.6	2.7	2.6	2.5	2.4	2.8	3.1	2.6	2.6	2.5	2.6	2.6	3.4	2.7	2.7	3.3	3.8	4.8	5.0	3.8	4.2	3.7	24	3.2
9	4.9	5.2	5.3	4.9	4.4	3.8	3.9	3.9	2.7	2.7	2.9	2.7	2.5	2.5	2.6	2.4	2.4	2.6	3.1	3.3	2.9	3.0	3.0	3.5	24	3.4
10	4.3	4.1	4.9	3.8	2.7	2.4	2.9	4.5	5.1	4.2	3.2	2.7	2.6	2.9	3.3	2.9	3.1	2.7	2.8	3.8	4.0	3.4	4.0	4.1	24	3.5
11	4.1	3.5	2.9	3.3	3.5	3.3	3.7	4.5	4.6	3.5	3.9	3.0	3.0	3.1	2.9	2.9	2.8	2.8	3.1	3.3	3.3	3.4	3.5	3.1	24	3.4
12	2.9	2.8	2.7	2.6	2.6	2.4	2.3	2.7	3.7	3.3	2.8	3.1	3.2	2.7	2.7	2.9	3.0	3.4	3.8	4.1	4.4	3.9	4.3	4.2	24	3.2
13	4.3	3.5	3.3	3.0	2.8	2.7	3.3	4.5	6.4	7.1	5.3	3.5	3.6	3.6	3.7	3.8	3.6	3.8	4.0	3.9	4.0	5.0	5.1	3.9	24	4.1
14	3.4	2.9	2.7	2.7	2.6	2.5	3.3	4.6	6.1	6.3	4.8	4.8	4.3	4.5	4.9	4.6	3.7	3.7	4.7	5.4	5.6	5.1	5.4	5.3	24	4.3
15	6.6	7.3	6.8	6.1	5.6	5.3	5.3	4.7	3.8	3.3	3.3	3.9	4.3	4.0	3.4	2.9	2.8	3.0	3.8	4.0	4.3	5.1	4.3	5.9	24	4.6
16	5.4	5.1	3.9	3.0	2.8	2.6	2.6	2.9	3.3	3.3	3.0	3.0	3.1	3.4	3.2	2.7	2.8	2.8	3.4	3.7	3.7	3.6	4.1	3.9	24	3.4
17	2.7	2.5	2.5	2.3	2.3	2.7	3.2	4.0	4.4	5.0	3.0	2.7	3.1	3.2	3.3	3.3	3.6	4.0	4.2	3.9	4.5	4.4	4.5	4.3	24	3.5
18	3.8	3.3	2.8	2.4	2.3	2.3	2.7	4.2	6.1	4.6	2.9	3.0	3.2	3.4	3.7	3.9	3.5	3.3	4.2	4.7	5.5	4.5	4.7	4.8	24	3.7
19	4.1	3.8	3.6	3.4	3.2	3.1	3.4	3.8	6.3	6.0	3.2	3.3	3.7	3.8	4.1	4.4	4.2	4.2	4.6	5.3	5.5	5.0	4.4	3.7	24	4.2
20	3.2	2.8	2.4	2.4	2.3	2.2	2.2	2.3	2.5	2.6	2.5	2.6	2.5	2.6	2.7	3.9	4.2	4.4	4.5	4.8	3.6	2.5	2.5	2.4	24	2.9
21	2.3	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.7	2.5	2.4	2.4	2.6	2.7	2.6	2.6	2.7	2.9	3.6	4.2	4.2	3.7	3.2	3.7	24	2.8
22	3.6	3.3	3.7	3.1	2.4	2.2	2.2	2.4	2.5	2.8	2.8	2.6	3.0	3.2	3.5	3.9	4.0	3.4	2.6	2.3	2.3	2.3	2.3	2.2	24	2.9
23	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.3	2.6	2.5	2.6	2.5	2.5	2.6	2.5	2.5	2.6	2.5	2.4	2.3	2.2	24	2.4
24	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.3	3.0	2.5	2.5	2.5	2.3	2.4	2.6	2.4	2.4	2.7	3.2	3.3	3.0	2.8	2.6	2.6	24	2.5
25	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.4		4.4	1.1	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.0	1.2	1.3	1.0	0.9	0.9	23	1.6
26	0.8	0.9	0.8	0.8	0.8	0.8	1.1	1.0	1.6	1.3	2.2	1.6	1.8	1.5	1.4	1.2	1.1	1.2	1.2	1.7	1.6	1.4	2.2	1.8	24	1.3
27	1.8	1.0	0.7	0.8	0.8	0.9	1.2	2.0	1.9	2.3	1.6	1.3	1.3	1.3	1.3	1.0	0.9	0.8	1.0	1.8	1.7	1.7	1.6	1.9	24	1.4
28	1.7	2.1	1.4	0.9	0.8	0.9	0.9	1.4	1.6	1.4	1.3	1.5	2.3	1.8	1.6	1.6	1.6	1.6	1.9	1.8	2.0	1.9	1.7	1.5	24	1.6
29	2.0	1.9	1.4	1.0	0.9	0.9	1.3	1.4	1.9	1.9	1.1	1.2	1.4	1.6	1.6	1.5	1.3	1.1	1.4	1.5	2.0	2.9	2.8	2.6	24	1.6
30	2.6	1.7	1.5	1.2	1.1	1.0	1.0	1.0	1.2	1.3	1.6	1.5	1.5	1.7	1.5	1.5	1.4	1.4	1.5	1.7	2.8	2.6	2.5	2.8	24	1.7
31	2.1	2.6	2.5	2.0	1.8	1.5	2.0	3.0	4.7	6.0	2.9	1.3	1.7	1.7	1.7	1.7	1.9	2.3	2.4	2.2	2.6	2.6	2.5	2.6	24	2.4
N	29	30	30	30	30	30	30	30	29	30	29	29	29	30	30	31	31	31	31	31	31	31	31	30	723	
MN	3.1	3.1	2.7	2.5	2.2	2.1	2.4	2.8	3.5	3.4	2.6	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.9	3.2	3.3	3.3	3.4	3.2	723	
MAX	6.6	7.3	6.8	6.1	5.6	5.3	5.3	4.7	6.4	7.1	5.3	4.8	4.3	4.5	4.9	4.6	4.2	4.5	5.0	5.4	5.6	5.1	5.4	5.9		7.3

SJJAN.WK4

Metered Ramp Carbon Monoxide Concentrations

Location: San Jose @ Mr. Choi's Residence
Site #: 002
Year: 1994
Month: February

HOUR

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	N	MEAN
1	2.5	2.2	1.8	1.4	1.3	1.2	1.3	2.0	3.0	3.0	2.3	2.0	2.0	1.7	1.7	1.9	2.3	2.0	2.9	2.8	3.0	2.6	2.7	2.3	24	2.2
2	3.2	2.8	2.6	2.2	2.0	2.1	2.4	5.9	4.7	4.8	2.8	2.4	2.6	2.6	3.3	3.9	2.8	3.0	3.8	2.8	3.0	3.1	3.5	3.5	24	3.2
3	4.0	3.2	2.9	2.0	1.5	1.5	1.4	2.1	3.3	2.7	2.4	2.4	2.0	2.6	3.0	3.3	2.5	2.2	2.5	2.5	2.4	2.2	2.5	2.7	24	2.5
4	2.2	1.9	1.9	1.6	1.2	1.3	1.6	2.3	3.8	4.1	3.1	2.3	2.2	1.9	2.1	2.1	1.8	1.7	1.9	2.0	1.8	1.9	1.8	1.7	24	2.1
5	1.5	1.4	1.4	1.2	1.0	1.0	1.0	1.2	1.2	1.3	1.2	1.2	1.2	1.3	1.2	1.8	3.3	2.5	1.6	1.8	2.9	1.6	1.4	1.2	24	1.5
6	1.2	1.0	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.1	1.3	1.2	1.3	1.3	1.2	1.3	1.4	1.5	1.4	1.2	1.3	1.1	1.0	24	1.1
7	1.0	1.0	1.0	0.9	0.9	0.9	1.0	1.9	2.1	1.6	1.3	1.2	1.3	1.4	1.5	2.2	1.4	1.7	1.6	2.3	1.9	1.6	1.2	1.4	24	1.4
8	1.3	1.0	1.0	1.0	1.0	1.0	1.5	2.5	2.7	4.1	2.1	1.8	1.7	1.5	1.5	1.4	1.5	1.4	1.5	1.6	1.8	2.0	2.5	2.6	24	1.8
9	2.5	2.2	1.7	1.2	1.0	1.0	1.0	1.5	1.9	1.8	1.4	1.5	1.4	1.6	1.8	1.9	2.0	1.7	1.6	1.7	2.0	2.6	3.5	3.8	24	1.8
10	4.2	2.7	2.0	1.5	1.3	1.5	1.5	1.6	1.9	1.7	1.4	1.4	1.3	1.4	1.3	1.6	1.5	1.4	1.6	1.6	1.8	1.5	1.7	1.8	24	1.7
11	1.8	2.0	1.7	1.8	1.7	1.5	2.6	2.1	2.6	3.7	3.1	1.8	1.5	1.5	1.6	1.4	1.4	1.3	1.2	1.3	2.0	1.6	1.9	2.1	24	1.9
12	1.6	1.7	2.6	2.1	1.2	1.0	1.2	1.4	2.0	2.1	1.5	1.5	1.6	1.8	2.0	2.2	2.2	2.1	1.9	2.5	2.3	2.5	2.2	1.8	24	1.9
13	1.8	1.5	1.5	1.7	1.7	1.6	1.4	1.5	1.7	1.3	1.3	1.4	1.8	2.0	2.2	2.1	2.1	2.0	1.9	1.8	1.8	2.1	2.2	4.6	24	1.9
14	4.2	2.4	1.6	2.0	1.9	1.9	3.2	3.3	5.4	6.0	2.8	1.7	1.9	2.3	2.4	2.5	2.4	2.1	2.0	2.1	3.0	2.6	2.8	2.1	24	2.7
15	2.6	3.1	2.2	1.5	1.4	1.7	1.6	1.7	1.6	1.5	1.6	1.6	1.7	1.8	1.9	2.1	2.1	2.6	2.9	2.9	2.7	3.2	2.4	1.5	24	2.1
16	1.2	1.2	1.2	1.2	1.2	1.3	1.5	1.8	2.1	1.8	1.5	1.4	1.4	1.5	1.5	1.4	1.5	1.6	1.6	1.5	1.4	1.4	1.4	1.3	24	1.5
17	1.2	1.1	1.1	1.1	1.0	1.1	1.4	1.6	2.1	2.1	1.4	1.6	1.7	1.5	1.7	1.7	1.8	1.5	1.8	1.8	1.9	1.6	1.5	1.3	24	1.5
18	1.3	1.1	1.1	1.2	1.1	1.0	1.3	1.6	1.6	1.6	1.4	1.2	1.5	1.6	1.6	1.7	1.6	1.7	1.5	1.5	2.1	2.0	2.0	1.9	24	1.5
19	1.5	1.4	1.5	1.4	1.3	1.2	1.2	1.2	1.2	1.3	1.5	1.4	1.5	1.5	1.4	1.2	1.3	1.2	1.3	1.2	1.2	1.3	1.3	1.3	24	1.3
20	1.5	1.5	1.3	1.4	1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.4	1.6	1.6	1.5	1.7	1.6	1.7	1.8	2.1	1.8	1.6	1.6	24	1.5
21	1.3	1.3	1.3	1.2	1.3	1.2	1.2	1.3	1.4	1.3	1.3	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.6	1.7	1.7	2.1	2.4	24	1.5
22	2.3	2.5	2.2	2.2	2.2	1.7	1.8	3.4	4.5	4.2	2.4	1.8	1.6	1.7	1.9	1.9	2.0	1.8	1.8	2.0	2.2	2.1	2.2	2.5	24	2.3
23	2.1	2.2	2.0	1.7	1.6	1.8	2.2	2.0	1.9	1.9	1.8	1.5	1.6	1.8	2.1	2.4	2.2	2.0	1.9	2.3	2.1	2.2	1.7	1.7	24	1.9
24	1.9	2.3	2.6	2.2	2.0	2.0	2.9	3.8	4.5	4.0	3.1	2.3	2.4	2.5	2.8	2.5	2.2	2.6	2.2	2.2	3.2	2.7	2.9	3.0	24	2.7
25	3.5	3.1	2.3	1.7	1.8	1.9	1.8	1.7	2.8	2.8	2.7	2.4	2.5	2.7	3.1	2.7	2.4	2.3	1.9	2.0	2.0	1.6	1.4	1.4	24	2.3
26	1.4	1.3	1.3	1.2	1.2	1.2	1.3	1.3	1.5	1.5	1.5	1.5	1.6	1.7	1.6	1.6	1.6	1.5	1.6	1.5	1.8	1.6	1.5	1.4	24	1.5
27	1.4	1.4	1.5	1.6	1.6	1.6	1.6	1.5	1.6	1.4	1.4	1.6	1.7	1.8	1.9	1.8	1.6	1.6	1.6	1.7	1.7	1.9	2.0	1.7	24	1.6
28	1.8	1.5	1.5	1.4	1.4	1.4	1.6	2.3	2.0	2.0	2.2	2.5	2.2	2.0	2.2	2.0	1.9	2.0	2.2	2.5	2.7	3.1	2.7	2.8	24	2.1

N	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	672	
MN	2.1	1.9	1.7	1.5	1.4	1.4	1.6	2.0	2.4	2.4	1.9	1.7	1.7	1.8	1.9	2.0	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.1	672	
MAX	4.2	3.2	2.9	2.2	2.2	2.1	3.2	5.9	5.4	6.0	3.1	2.5	2.6	2.7	3.3	3.9	3.3	3.0	3.8	2.9	3.2	3.2	3.5	4.6		6.0

Metered Ramp Carbon Monoxide Concentrations

Location: San Jose @ Mr. Choi's Residence
Site #: 002
Year: 1994
Month: March

HOUR

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	N	MEAN
1	2.0	1.7	1.7	1.6	1.5	1.8	1.7	1.9	2.7	2.1	2.6	2.4	2.7	3.2	2.6	2.5	2.5	2.7	2.8	3.0	3.1	3.7	3.0	3.2	24.0	2.4
2	3.1	2.9	2.6	2.5	2.3	2.2	2.7	2.9	4.5	4.4	3.2	2.6													12.0	3.0
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28																										
N	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	36	
MN	2.6	2.3	2.2	2.1	1.9	2.0	2.2	2.4	3.6	3.3	2.9	2.5	2.7	3.2	2.6	2.5	2.5	2.7	2.8	3.0	3.1	3.7	3.0	3.2	36	
MAX	3.1	2.9	2.6	2.5	2.3	2.2	2.7	2.9	4.5	4.4	3.2	2.6	2.7	3.2	2.6	2.5	2.5	2.7	2.8	3.0	3.1	3.7	3.0	3.2		4.5

SJMAR.WK4

AMBIENT AIR QUALITY SUMMARY PAGE: 1
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

JOB DESCRIPTION: SCL-280 at DE ANZA BLVD.
SITE CODE: 001
DATA FILE: CUP WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

OBSERVED MAXIMUMS:

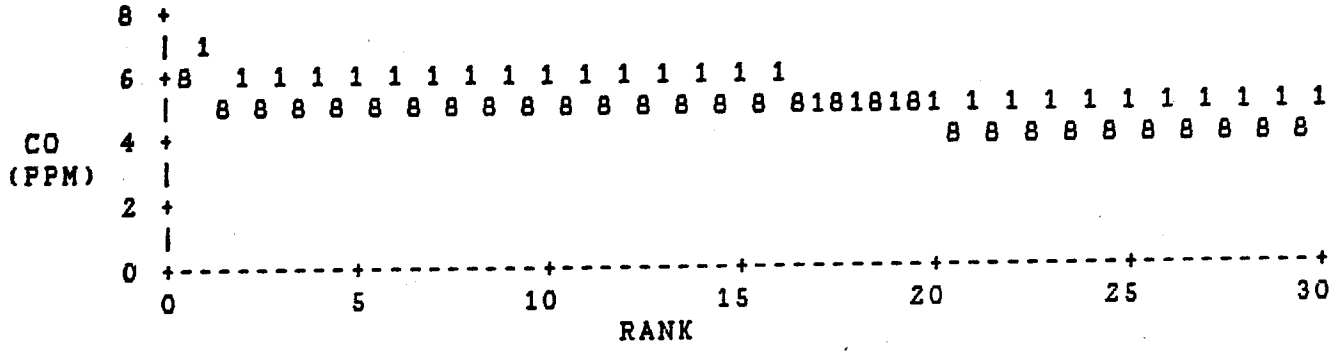
TYPE	AVG.TIME (HRS.)	DAYS USED	VALUE (PPM)	DATE	TIME
DAILY	1	79	7.0	01/19/94	0900-1000
	8	79	5.0	01/20/94	1200-2000
MORNING	1	79	7.0	01/19/94	0900-1000
	8	71	4.8	01/19/94	0700-1500
MIDDAY	1	71	6.0	12/21/93	1600-1700
	8	70	4.8	01/19/94	0900-1700
EVENING	1	79	6.0	12/16/93	1700-1800
	8	71	5.0	01/20/94	1200-2000
NOCTURNAL	1	73	5.0	01/04/94	2100-2200
	8	73	3.5	12/26/93	2000-0400

AMBIENT AIR QUALITY SUMMARY PAGE: 2
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

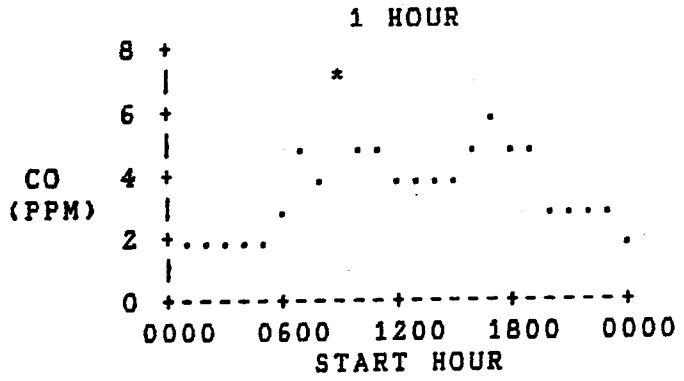
JOB DESCRIPTION: SCL-280 at DE ANZA BLVD.
SITE CODE: 001
DATA FILE: CUP WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

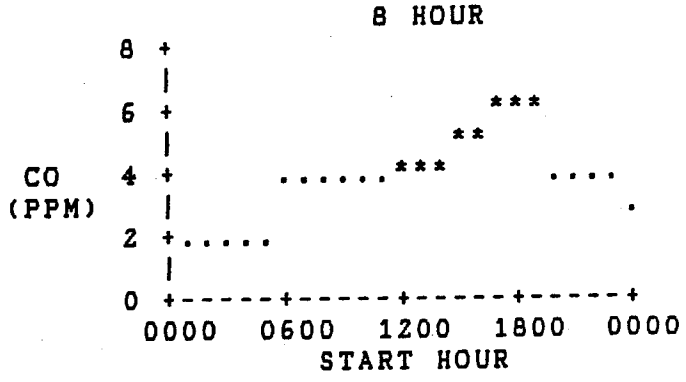
GRAPHICAL SUMMARY OF DAILY MAXIMUMS

RANKED RESULTS:



OBSERVED MAXIMUMS (*)
(I= INTERPOLATED VALUE)



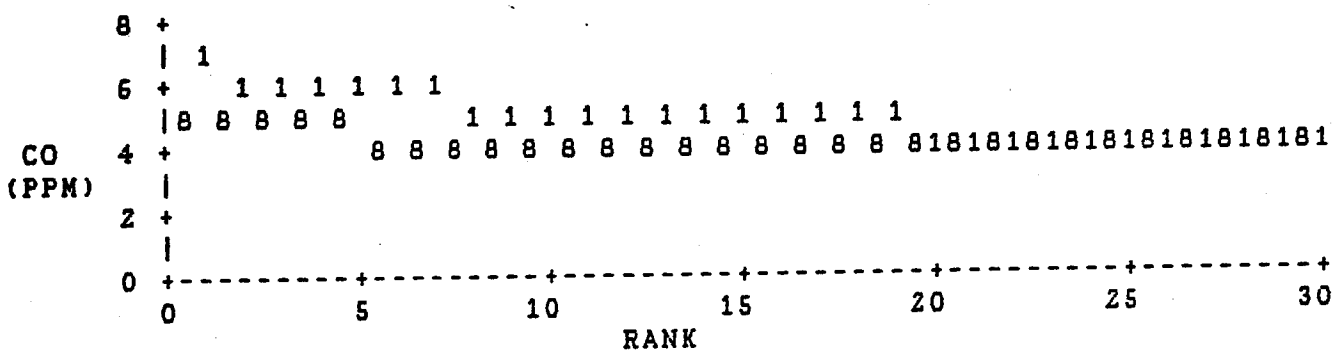


AMBIENT AIR QUALITY SUMMARY PAGE: 3
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

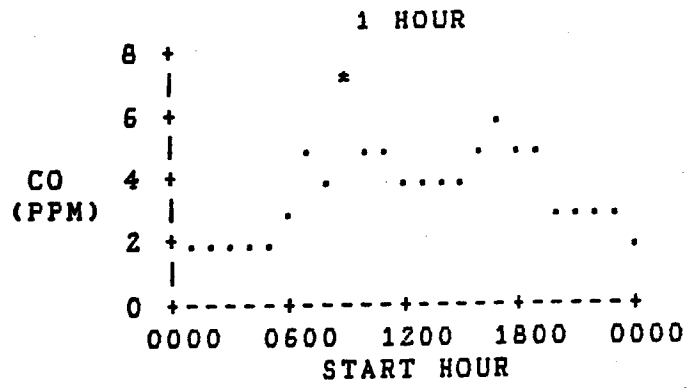
JOB DESCRIPTION: SCL-280 at DE ANZA BLVD.
SITE CODE: 001
DATA FILE: CUP WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

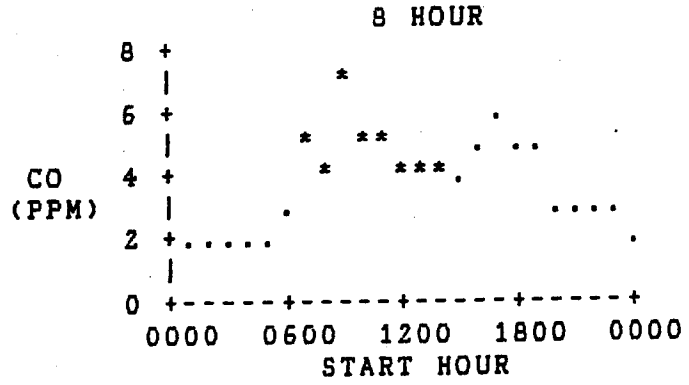
GRAPHICAL SUMMARY OF MORNING MAXIMUMS

RANKED RESULTS:



OBSERVED MAXIMUMS (*)
(I= INTERPOLATED VALUE)



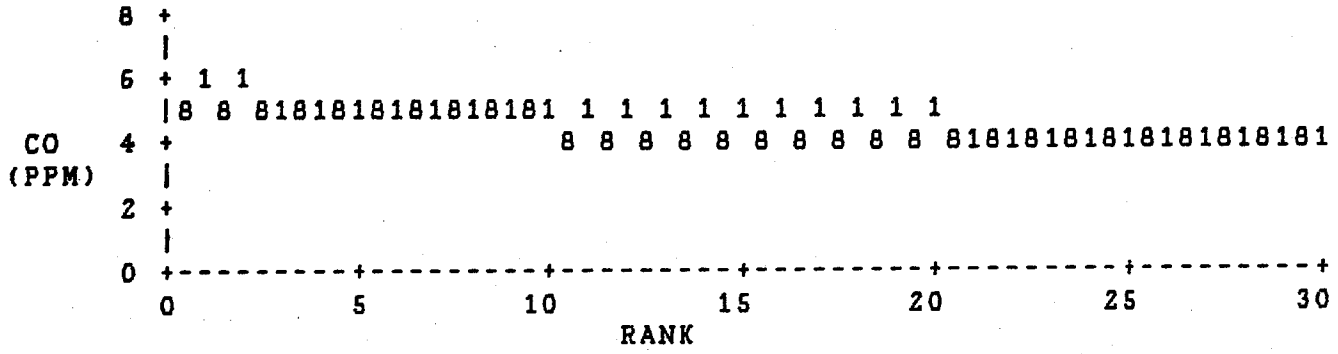


AMBIENT AIR QUALITY SUMMARY PAGE: 4
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

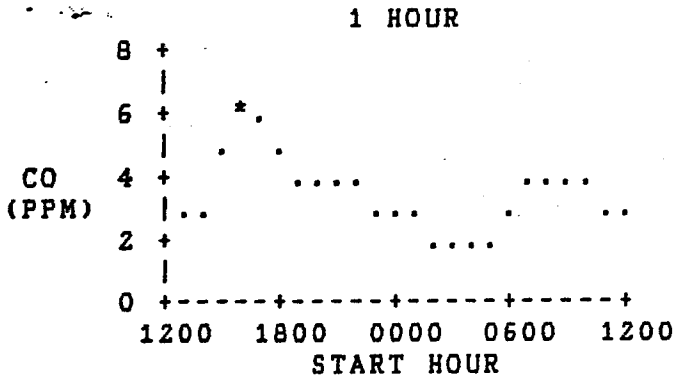
JOB DESCRIPTION: SCL-280 at DE ANZA BLVD.
SITE CODE: 001
DATA FILE: CUP WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

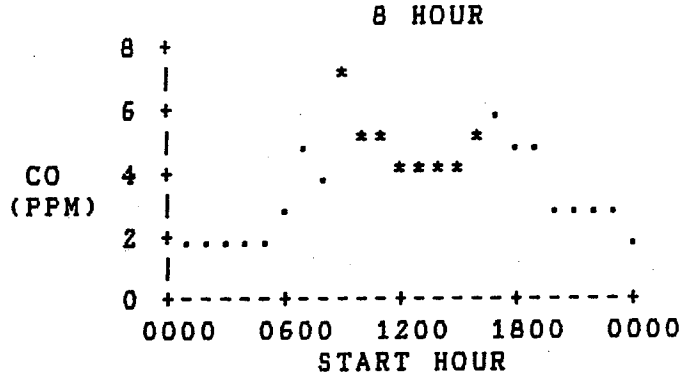
GRAPHICAL SUMMARY OF MIDDAY MAXIMUMS

RANKED RESULTS:



OBSERVED MAXIMUMS (*)
(I= INTERPOLATED VALUE)



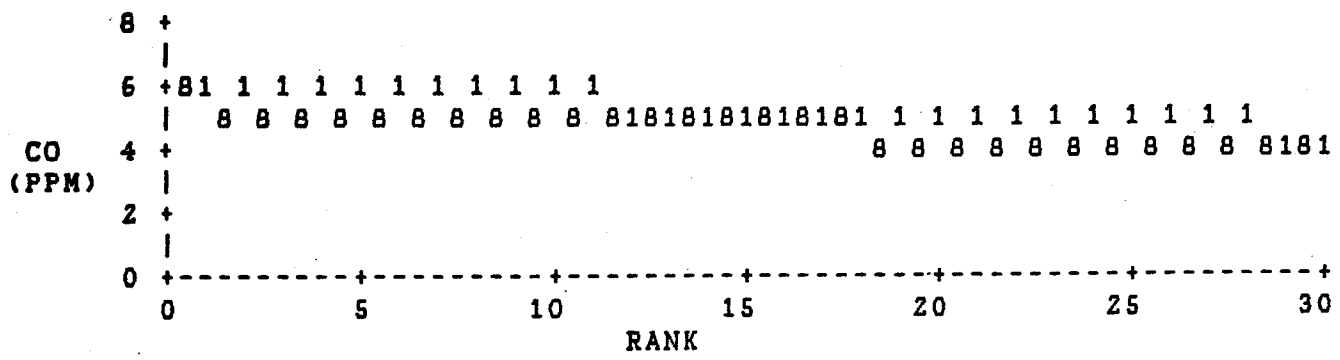


AMBIENT AIR QUALITY SUMMARY PAGE: 5
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

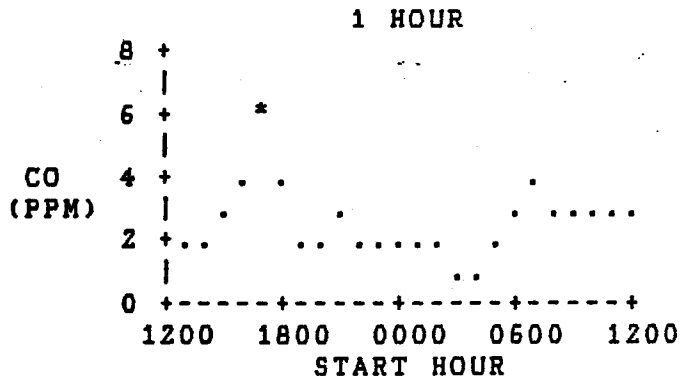
JOB DESCRIPTION: SCL-280 at DE ANZA BLVD.
SITE CODE: 001
DATA FILE: CUP WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

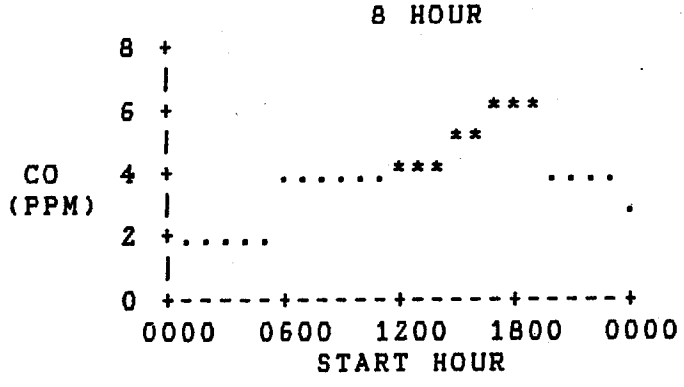
GRAPHICAL SUMMARY OF EVENING MAXIMUMS

RANKED RESULTS:



OBSERVED MAXIMUMS (*)
(I= INTERPOLATED VALUE)



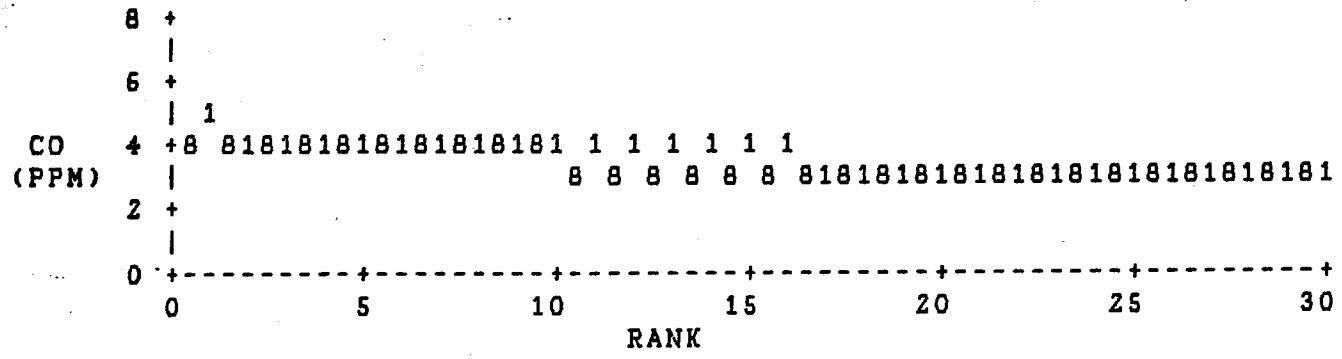


AMBIENT AIR QUALITY SUMMARY PAGE: 6
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

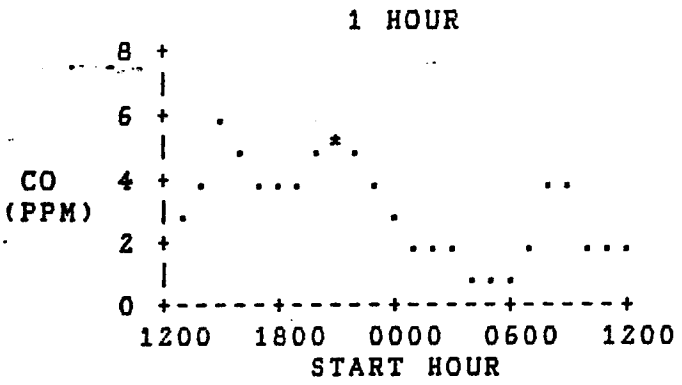
JOB DESCRIPTION: SCL-280 at DE ANZA BLVD.
SITE CODE: 001
DATA FILE: CUP WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

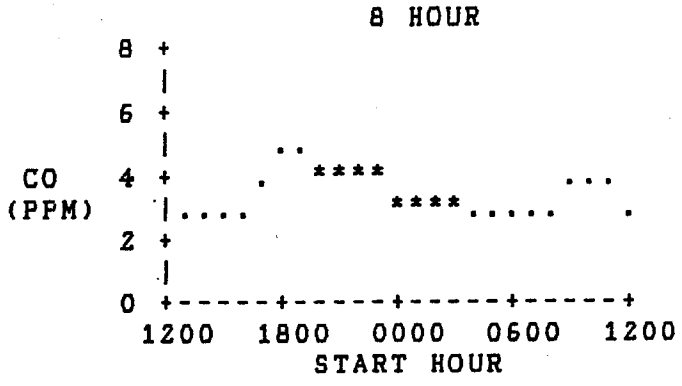
GRAPHICAL SUMMARY OF NOCTURNAL MAXIMUMS

RANKED RESULTS:



OBSERVED MAXIMUMS (*)
(I= INTERPOLATED VALUE)





PERIOD	PROBABILITY 1HR	8HR
DAILY	0.026	0.026
MORNING	0.026	0.036
MIDDAY	0.034	0.039
EVENING	0.026	0.034
NOCTURNAL	0.031	0.031

OUTLIER SUMMARY: NO OUTLIERS FOUND

OUTLIER TESTS IN THIS PROGRAM DID NOT IDENTIFY POTENTIAL OUTLIERS. HOWEVER, YOU SHOULD EXAMINE YOUR DATA (AND ANY OTHER DATA COLLECTED SIMULTANEOUSLY) TO TO BE SURE THAT REASONABLE CONCENTRATIONS ARE STUDIED BY OBSMAX

AMBIENT AIR QUALITY SUMMARY PAGE: 1
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

JOB DESCRIPTION: SCL-101 at SILVER CREEK RD.
SITE CODE: 002
DATA FILE: SJ WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

OBSERVED MAXIMUMS:

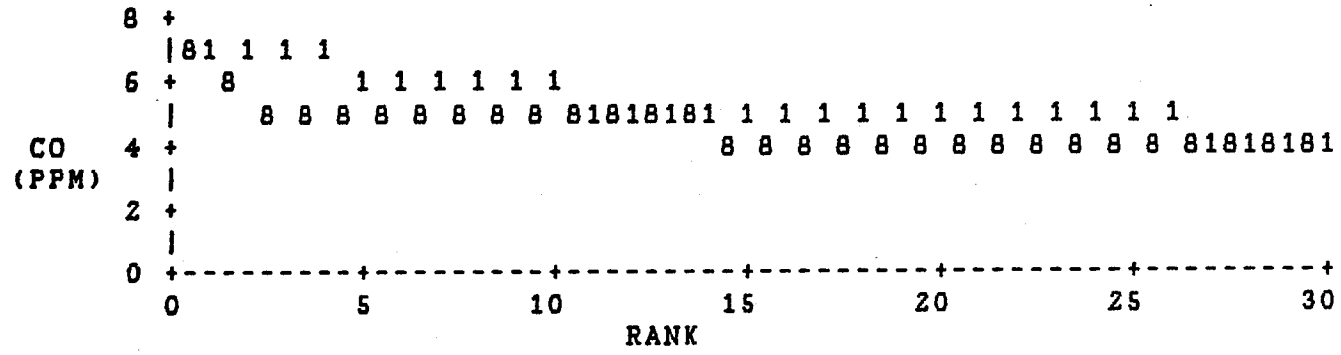
TYPE	AVG.TIME (HRS.)	DAYS USED	VALUE (PPM)	DATE	TIME
DAILY	1	79	7.0	01/06/94	0800-0900
	8	79	6.0	01/14/94	1900-0300
MORNING	1	79	7.0	01/06/94	0800-0900
	8	75	5.1	01/14/94	0600-1400
MIDDAY	1	77	5.0	01/14/94	1000-1100
	8	75	4.9	01/14/94	0800-1600
EVENING	1	79	6.0	01/14/94	1900-2000
	8	76	6.0	01/14/94	1900-0300
NOCTURNAL	1	77	7.0	01/14/94	2300-0000
	8	77	6.0	01/14/94	2000-0400

AMBIENT AIR QUALITY SUMMARY PAGE: 2
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

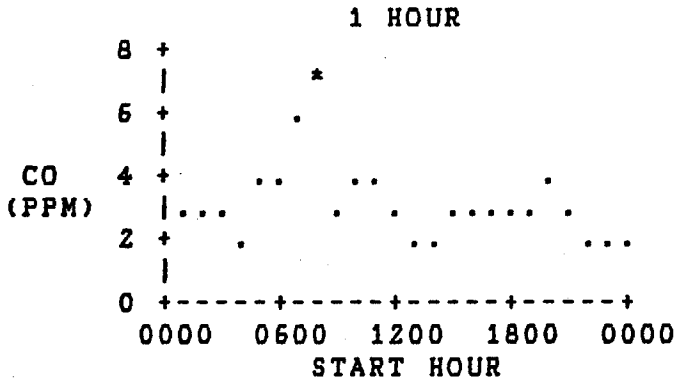
JOB DESCRIPTION: SCL-101 at SILVER CREEK RD.
SITE CODE: 002
DATA FILE: SJ WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

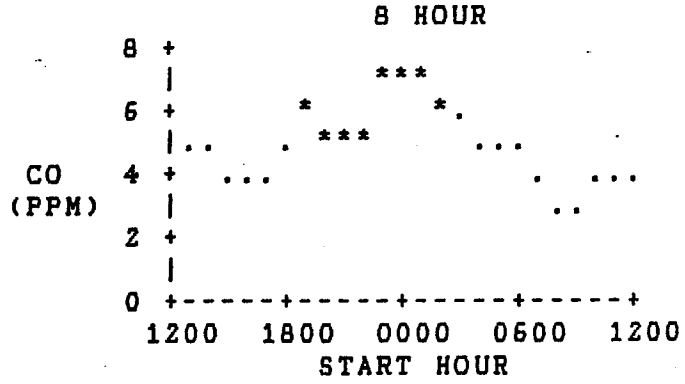
GRAPHICAL SUMMARY OF DAILY MAXIMUMS

RANKED RESULTS:



OBSERVED MAXIMUMS (*)
(I= INTERPOLATED VALUE)



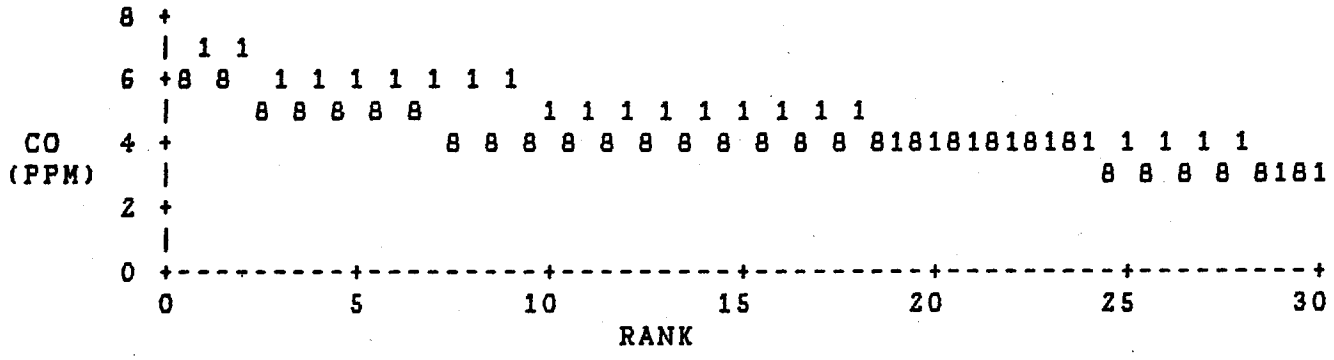


AMBIENT AIR QUALITY SUMMARY PAGE: 3
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

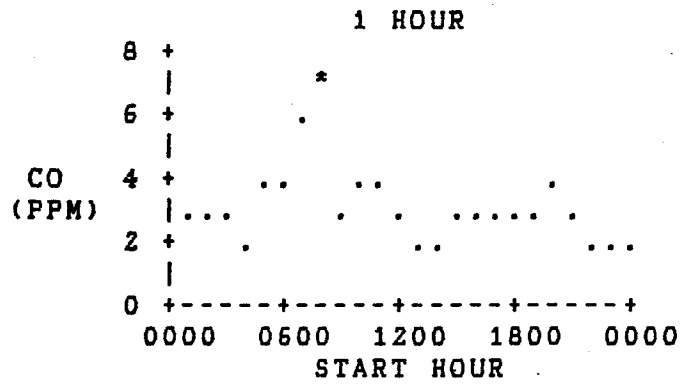
JOB DESCRIPTION: SCL-101 at SILVER CREEK RD.
SITE CODE: 002
DATA FILE: SJ WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

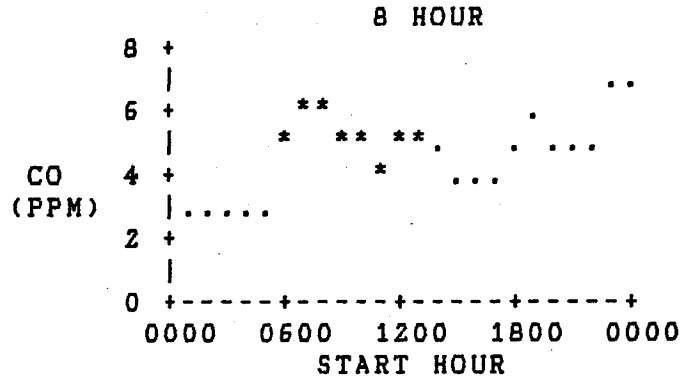
GRAPHICAL SUMMARY OF MORNING MAXIMUMS

RANKED RESULTS:



OBSERVED MAXIMUMS (*)
(I= INTERPOLATED VALUE)



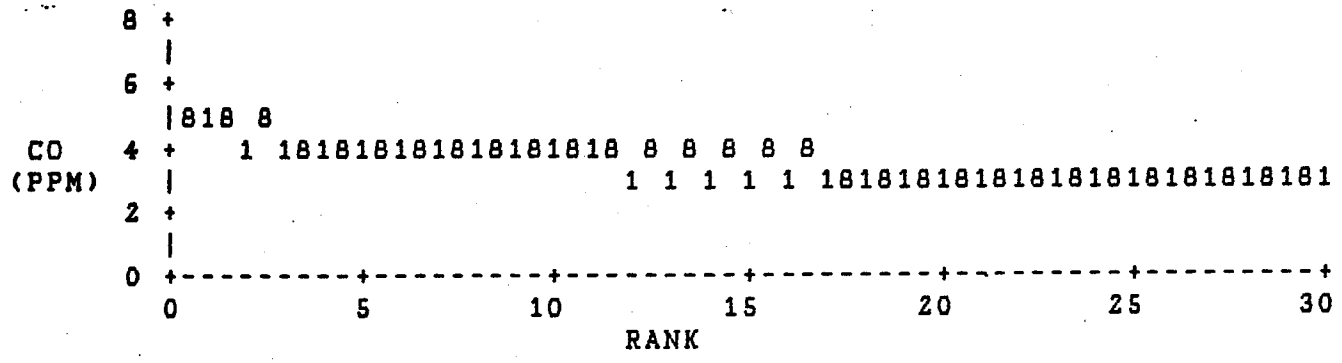


AMBIENT AIR QUALITY SUMMARY PAGE: 4
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

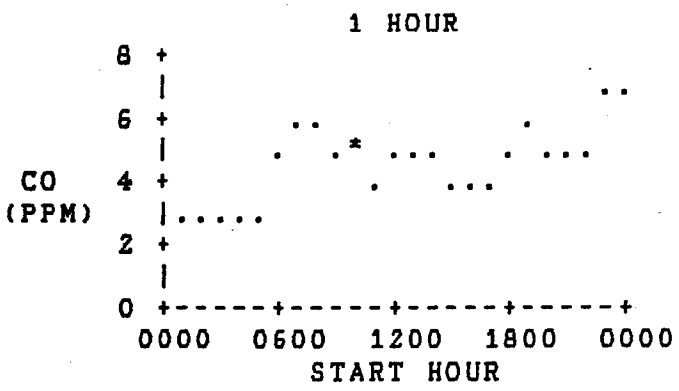
JOB DESCRIPTION: SCL-101 at SILVER CREEK RD.
SITE CODE: 002
DATA FILE: SJ WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

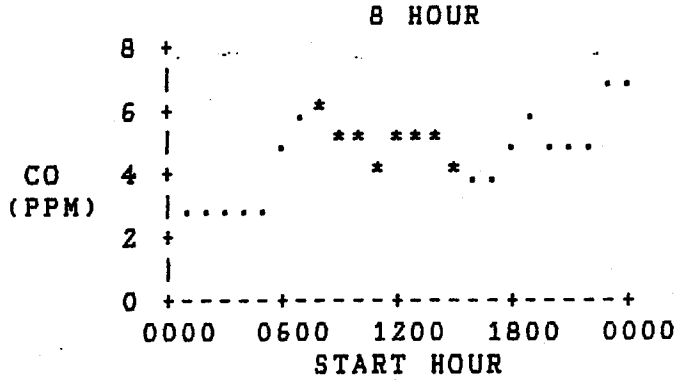
GRAPHICAL SUMMARY OF MIDDAY MAXIMUMS

RANKED RESULTS:



OBSERVED MAXIMUMS (*)
(I= INTERPOLATED VALUE)



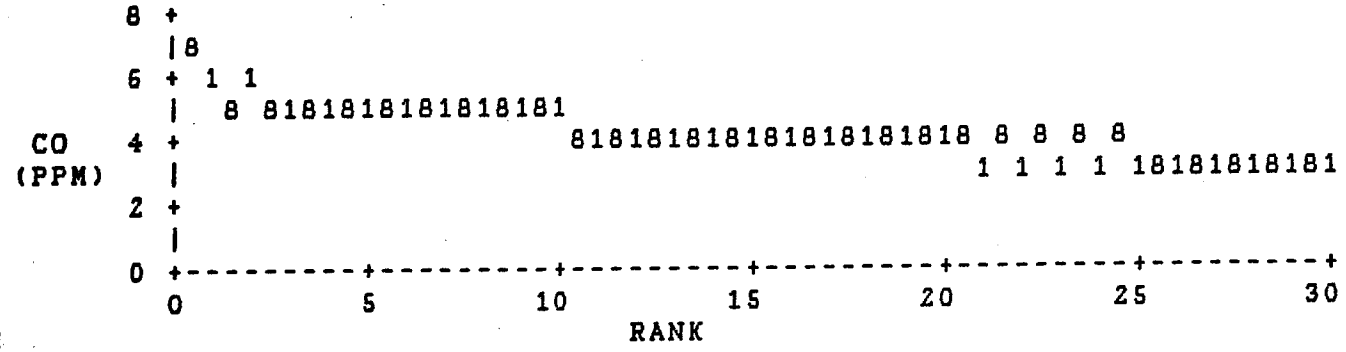


AMBIENT AIR QUALITY SUMMARY PAGE: 5
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

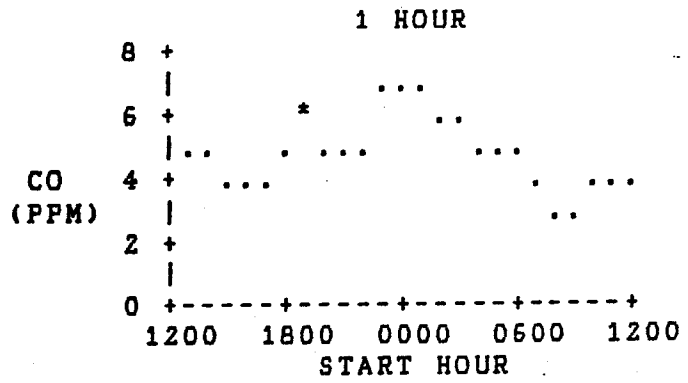
JOB DESCRIPTION: SCL-101 at SILVER CREEK RD.
SITE CODE: 002
DATA FILE: SJ WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

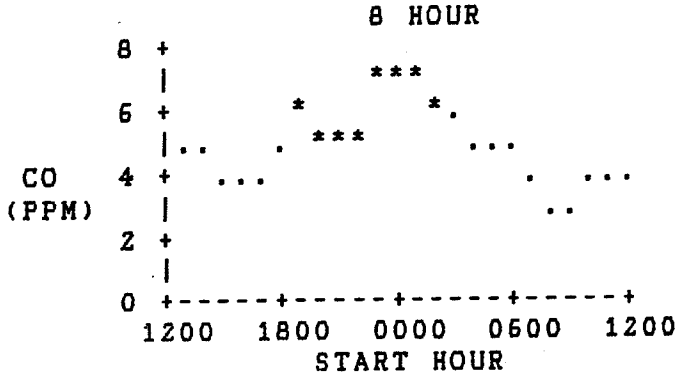
GRAPHICAL SUMMARY OF EVENING MAXIMUMS

RANKED RESULTS:



OBSERVED MAXIMUMS (*)
(I= INTERPOLATED VALUE)



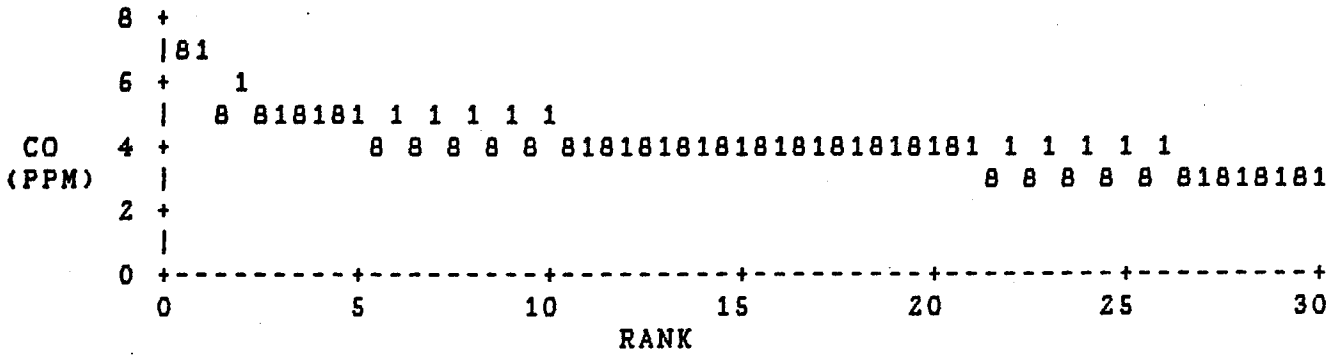


AMBIENT AIR QUALITY SUMMARY PAGE: 6
OBSERVED MAXIMUM ANALYSIS
POLLUTANT: CARBON MONOXIDE

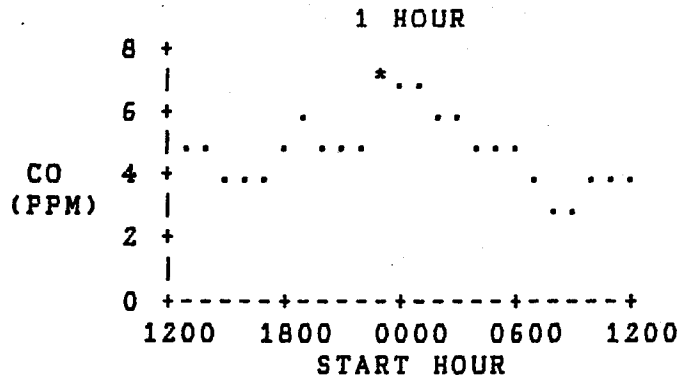
JOB DESCRIPTION: SCL-101 at SILVER CREEK RD.
SITE CODE: 002
DATA FILE: SJ WDATA
FROM: 12/14/93 TO: 3/2/94 NUMBER OF RECORDS: 79

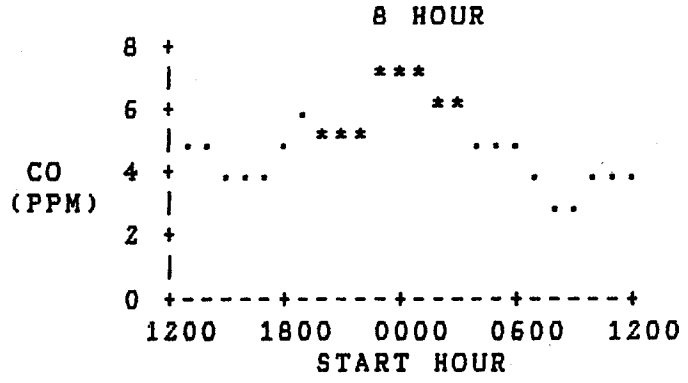
GRAPHICAL SUMMARY OF NOCTURNAL MAXIMUMS

RANKED RESULTS:



OBSERVED MAXIMUMS (*)
(I= INTERPOLATED VALUE)

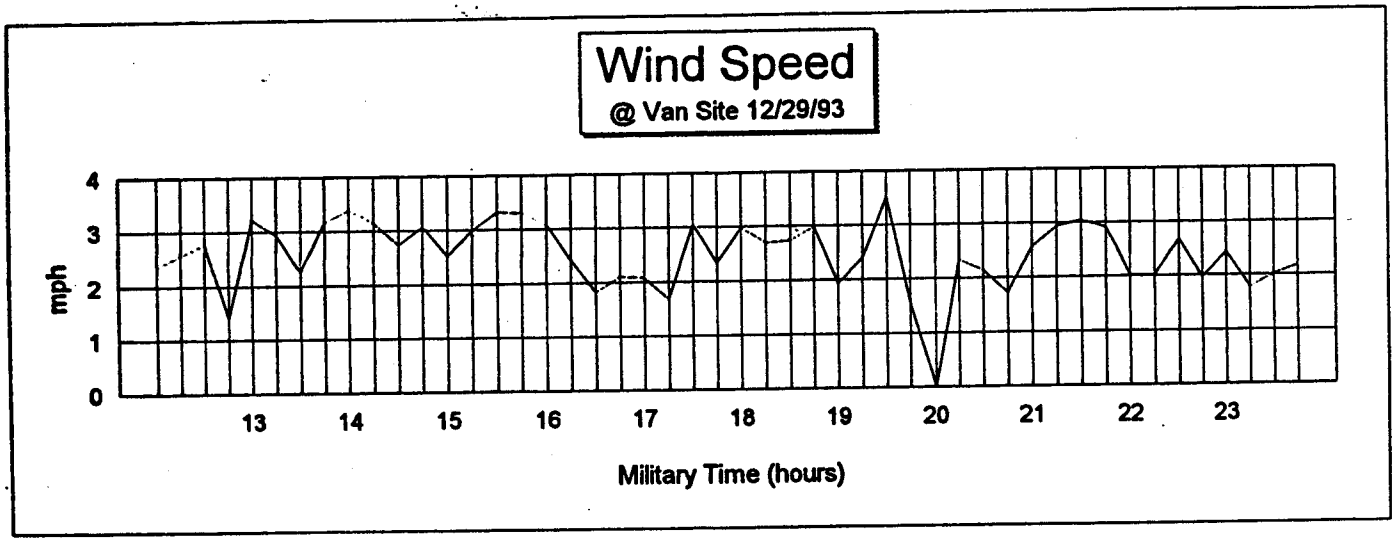


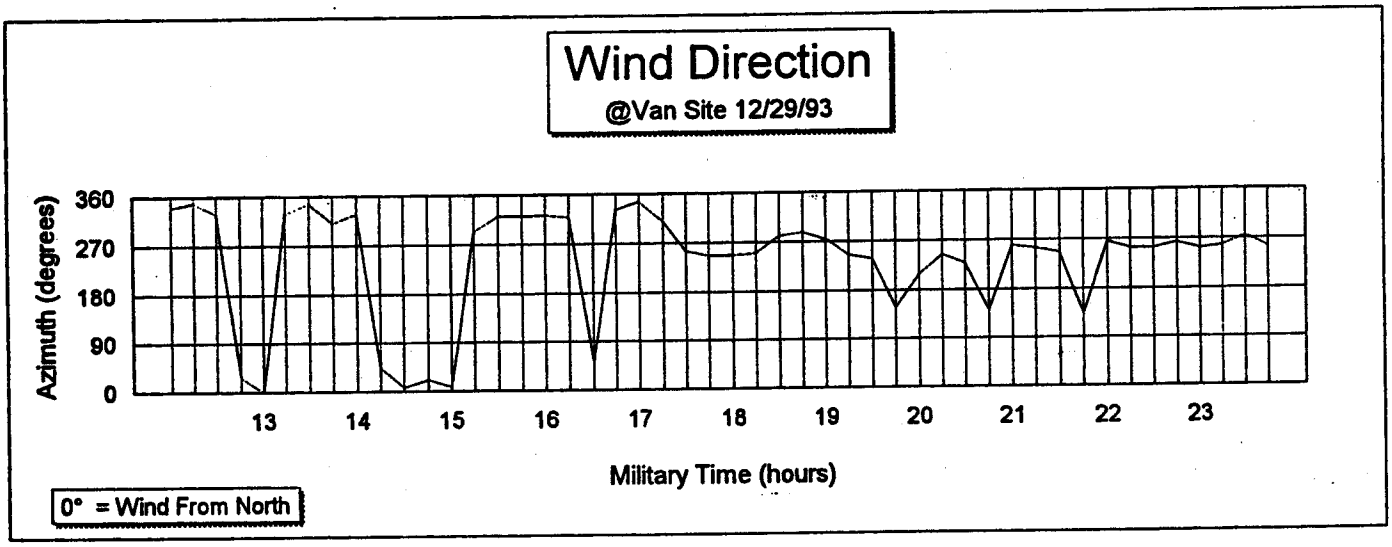


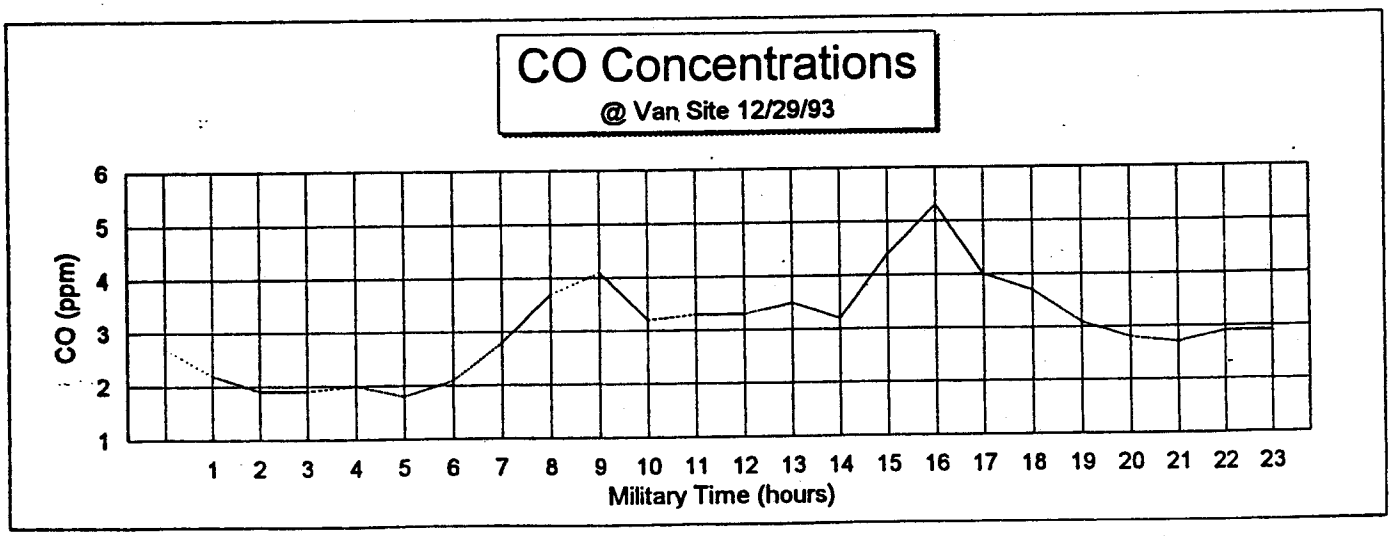
PERIOD	PROBABILITY 1HR	8HR
DAILY	0.026	0.026
MORNING	0.026	0.031
MIDDAY	0.027	0.031
EVENING	0.026	0.027
NOCTURNAL	0.026	0.026

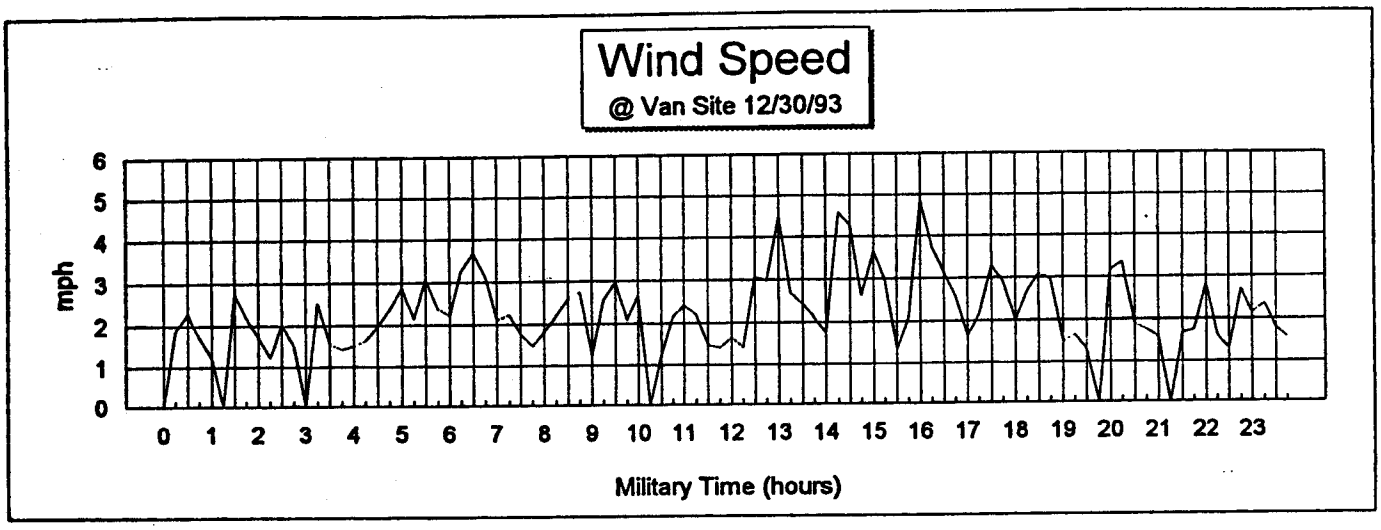
OUTLIER SUMMARY: NO OUTLIERS FOUND

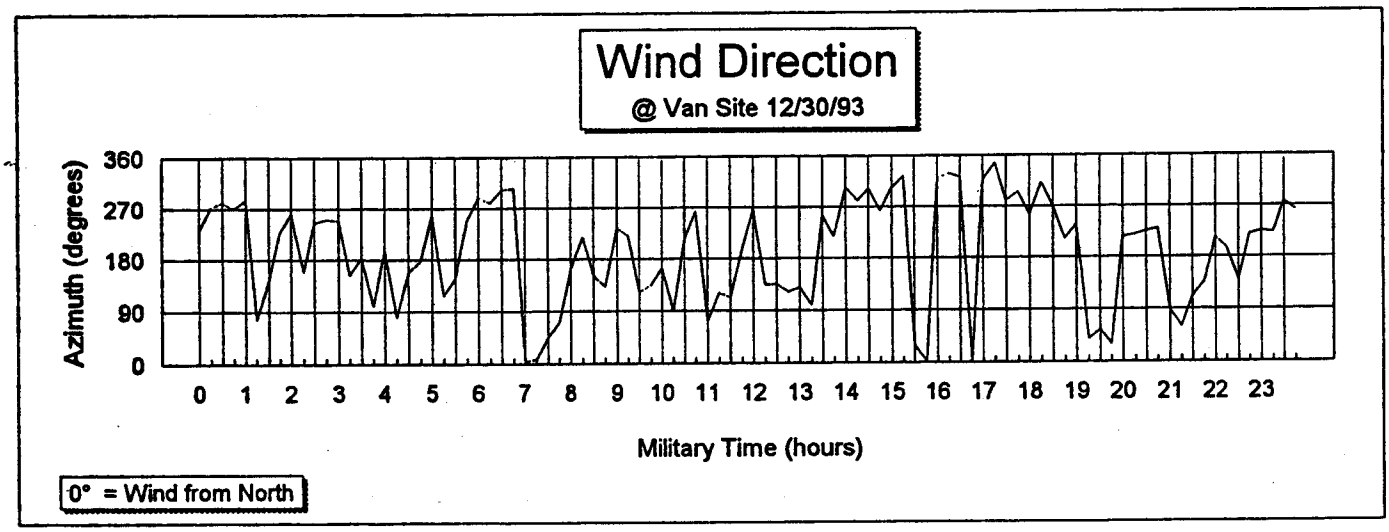
OUTLIER TESTS IN THIS PROGRAM DID NOT IDENTIFY POTENTIAL OUTLIERS. HOWEVER, YOU SHOULD EXAMINE YOUR DATA (AND ANY OTHER DATA COLLECTED SIMULTANEOUSLY) TO TO BE SURE THAT REASONABLE CONCENTRATIONS ARE STUDIED BY OBSMAX

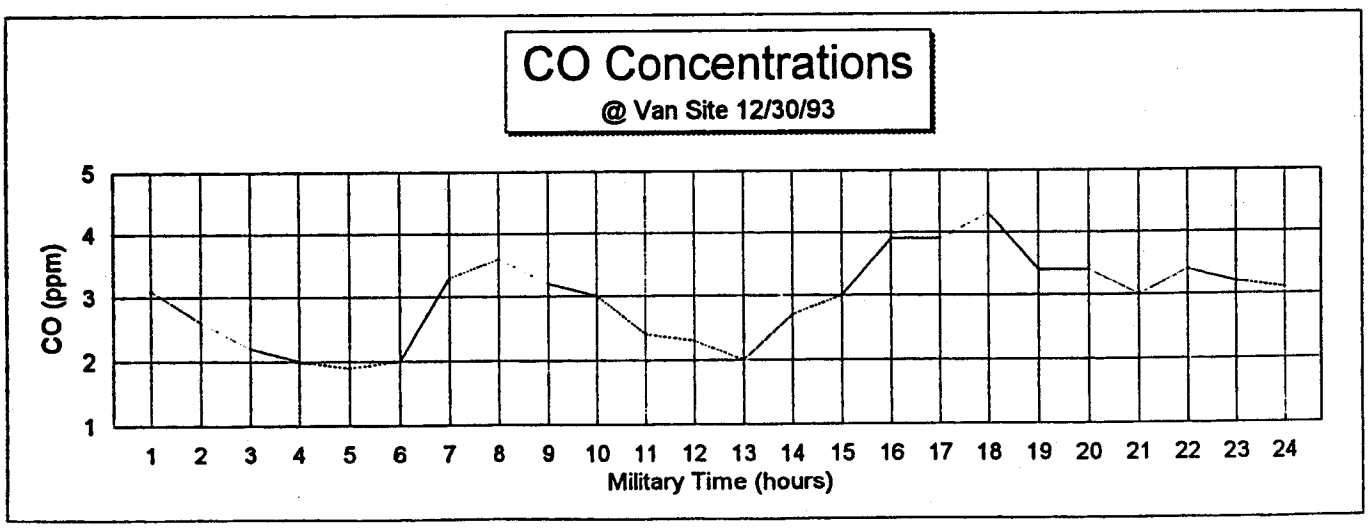

Wind Speed
@ Van Site 12/29/93
mph
0
1
2
3
4
13
14
15
16
17
18
19
20
21
22
23
Military Time (hours)

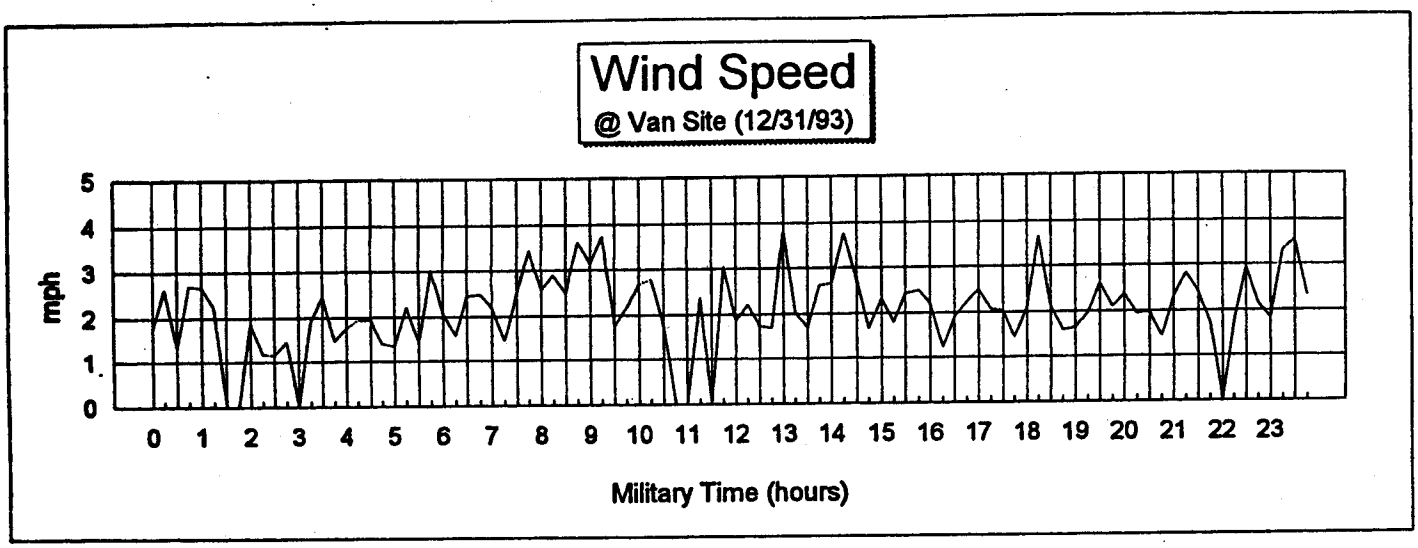

Wind Direction
@Van Site 12/29/93
Azimuth (degrees)
0
90
180
270
360
13
14
15
16
17
18
19
20
21
22
23
Military Time (hours)
0° = Wind From North

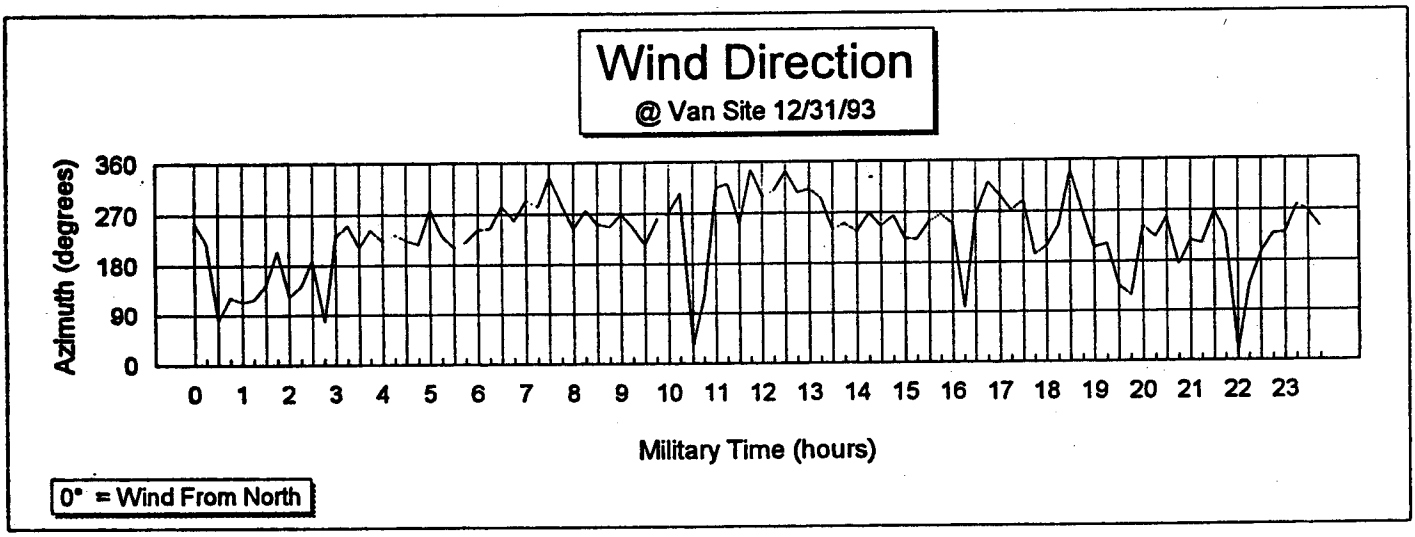

CO Concentrations
@ Van Site 12/29/93
CO (ppm)
1
2
3
4
5
6
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Military Time (hours)

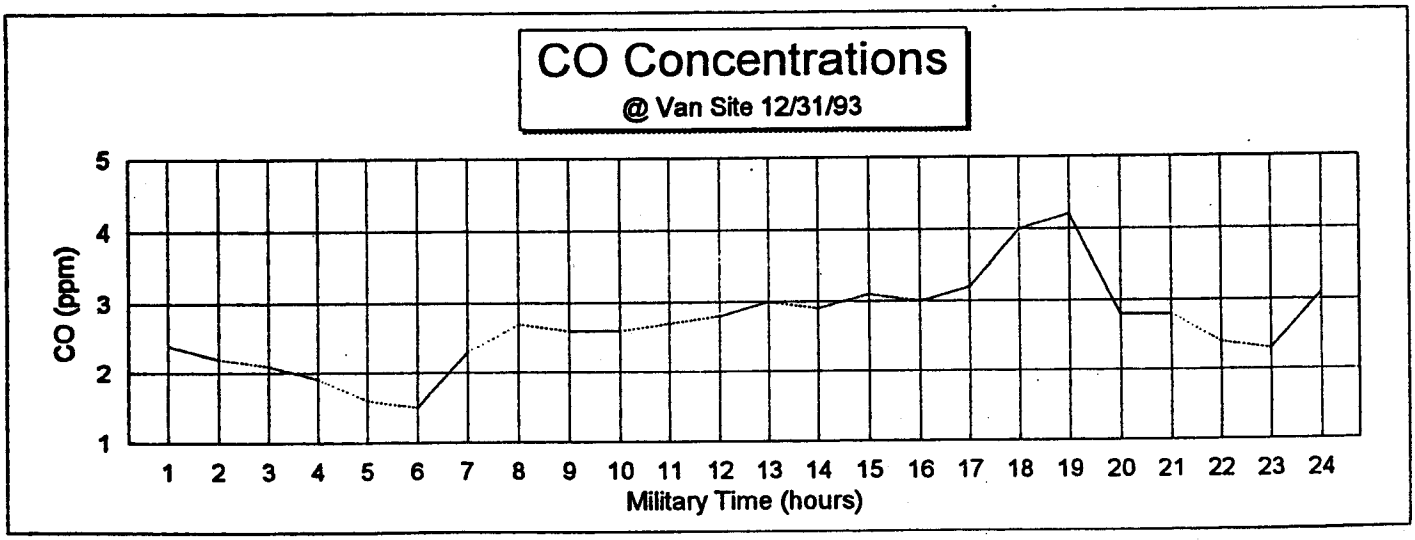

Wind Speed
@ Van Site 12/30/93
mph
0
1
2
3
4
5
6
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)

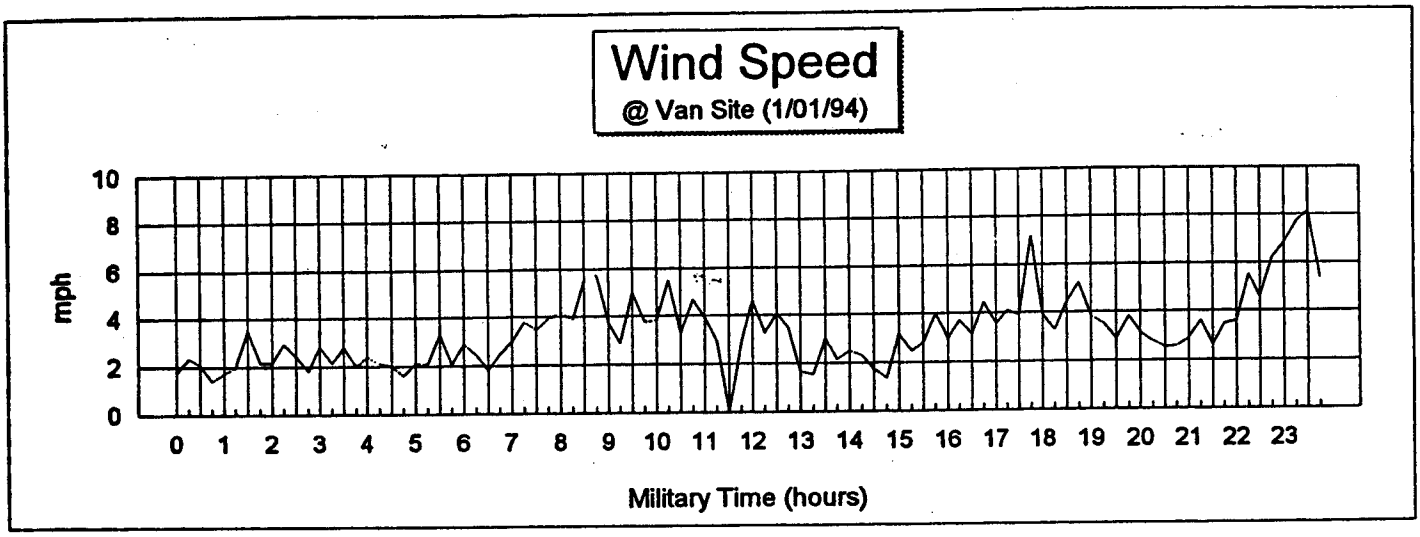

Wind Direction
@ Van Site 12/30/93
Azimuth (degrees)
0
90
180
270
360
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)
0° = Wind from North

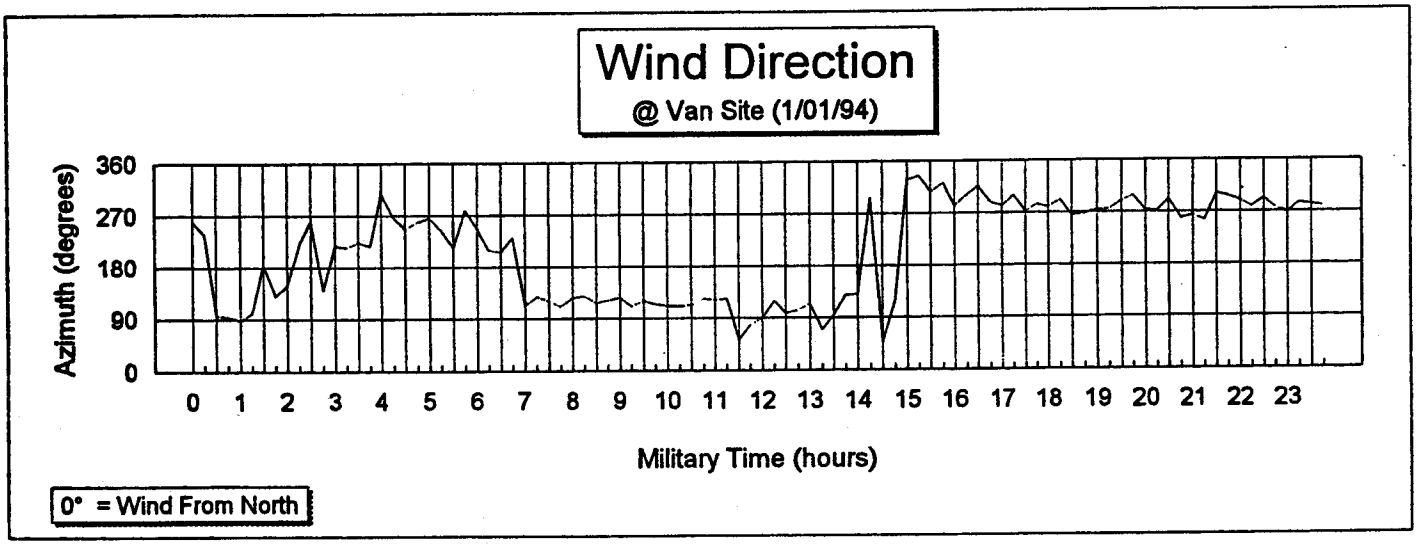

CO Concentrations
@ Van Site 12/30/93
CO (ppm)
1
2
3
4
5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Military Time (hours)

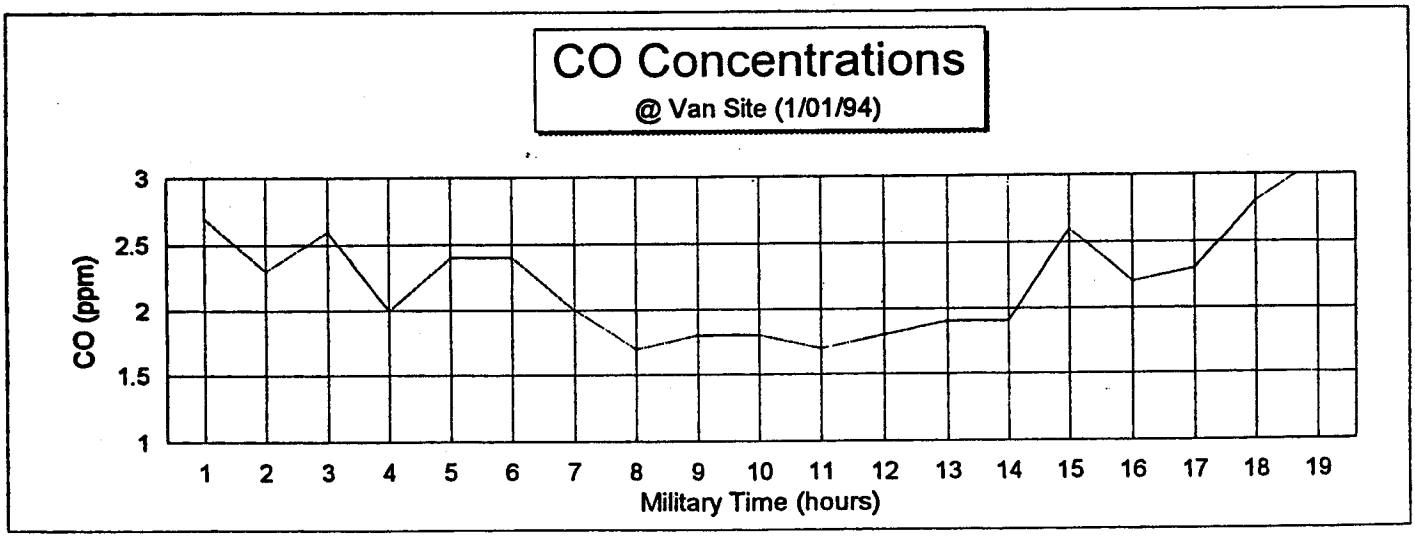

Wind Speed
@ Van Site (12/31/93)
mph
5
4
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)

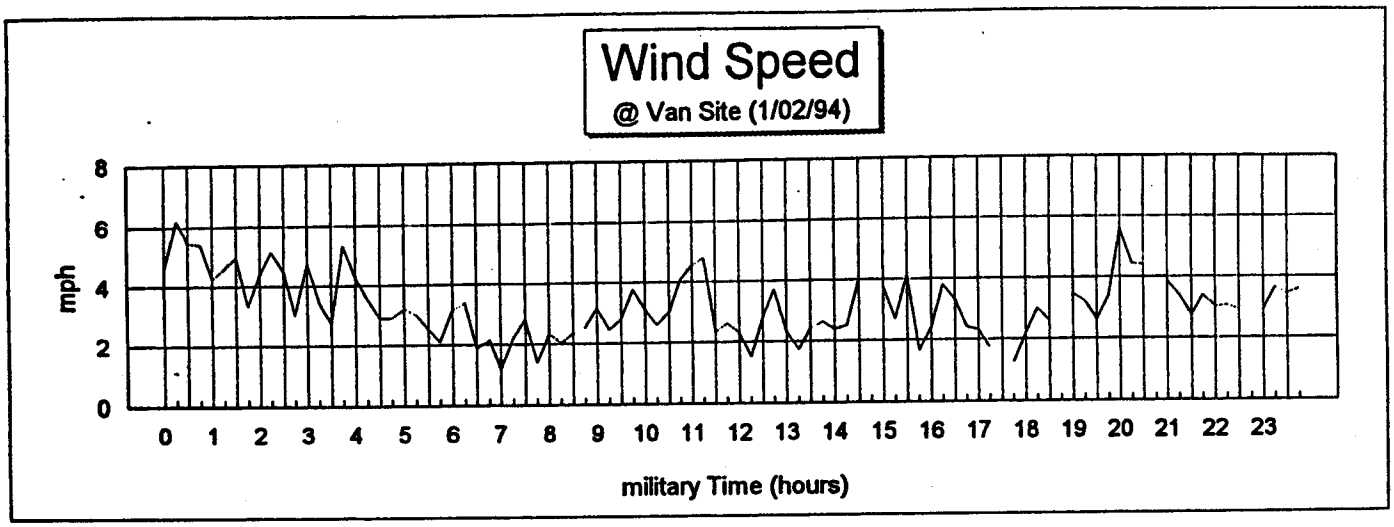

Wind Direction
@ Van Site 12/31/93
Azimuth (degrees)
360
270
180
90
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)
0° = Wind From North

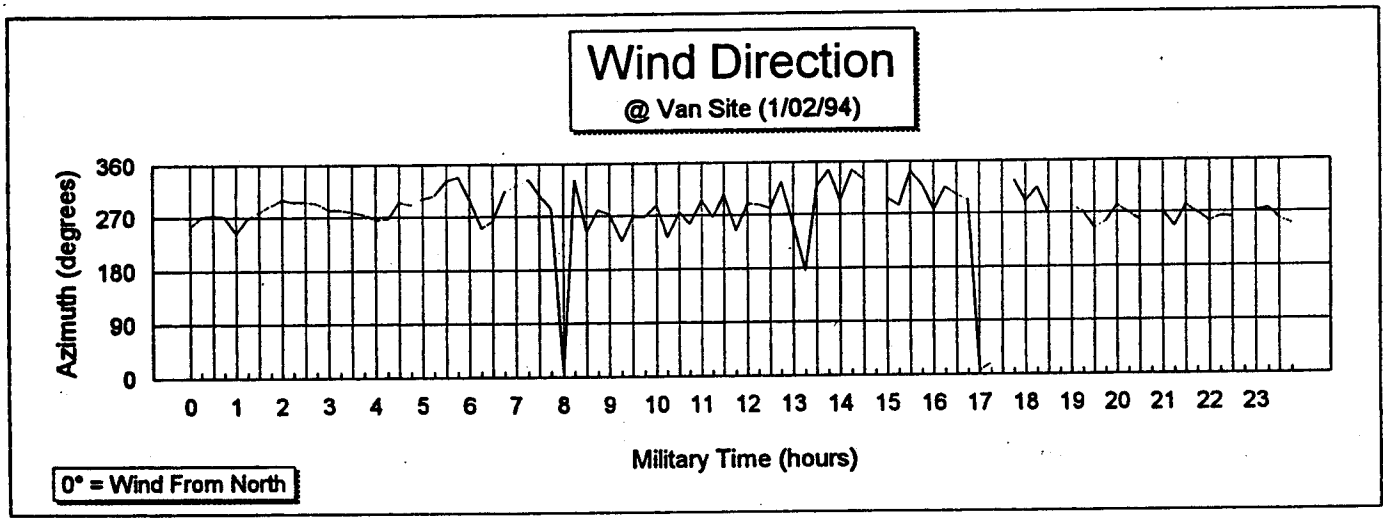

CO Concentrations
@ Van Site 12/31/93
CO (ppm)
5
4
3
2
1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Military Time (hours)

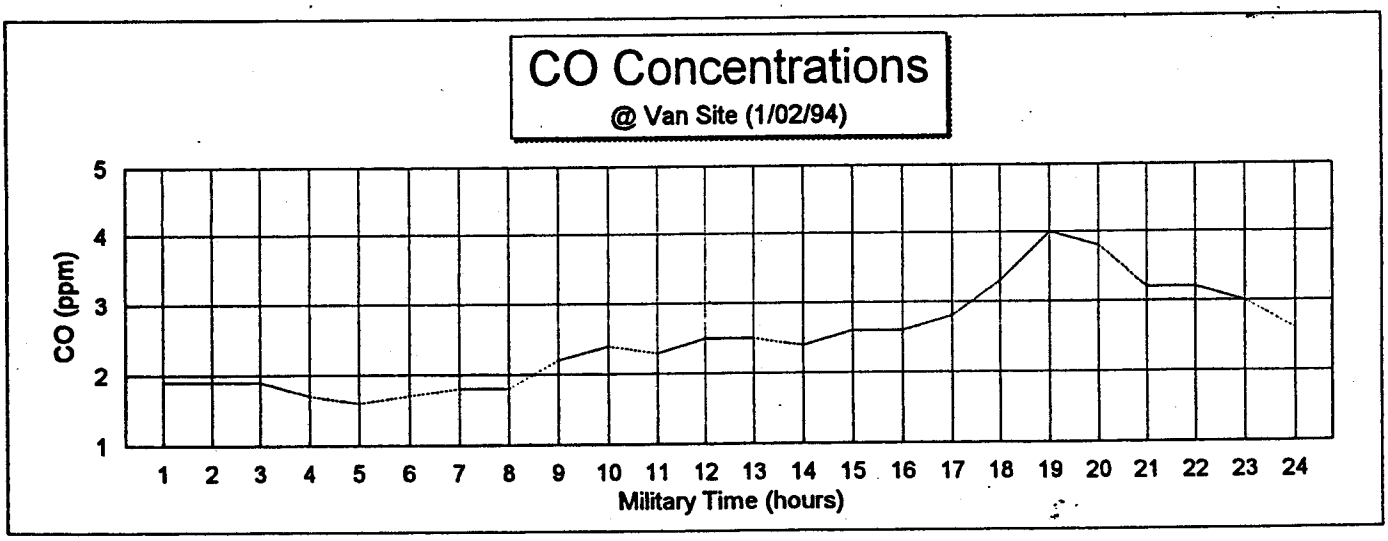

Wind Speed
@ Van Site (1/01/94)
mph
10
8
6
4
2
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)

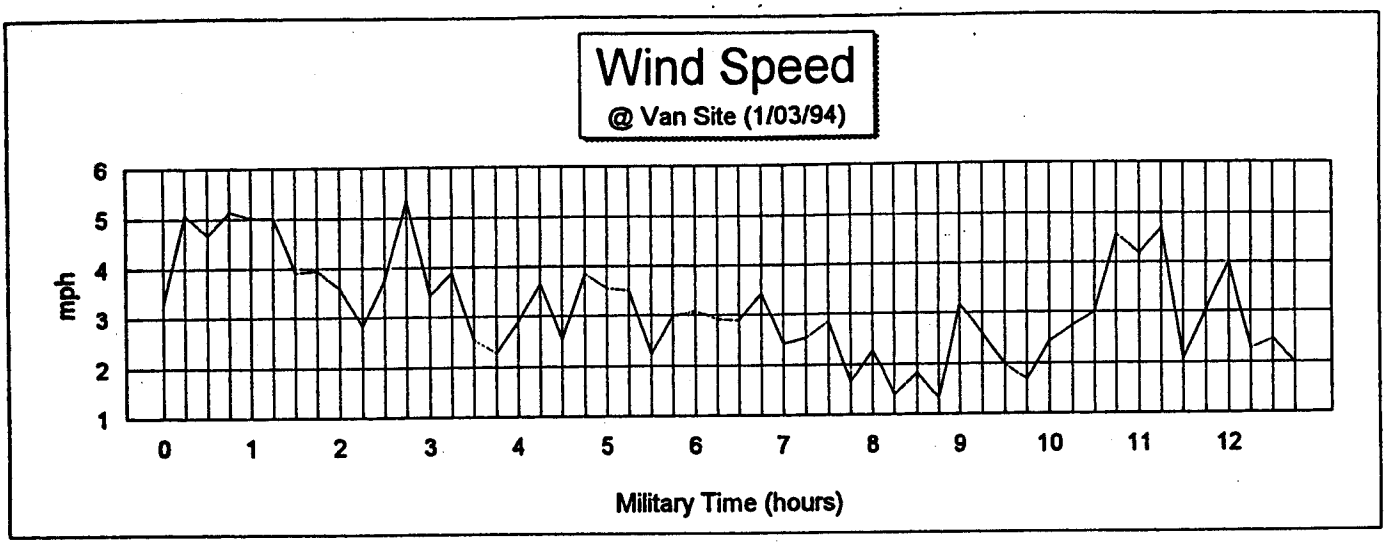

Wind Direction
@ Van Site (1/01/94)
Azimuth (degrees)
360
270
180
90
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)
0° = Wind From North

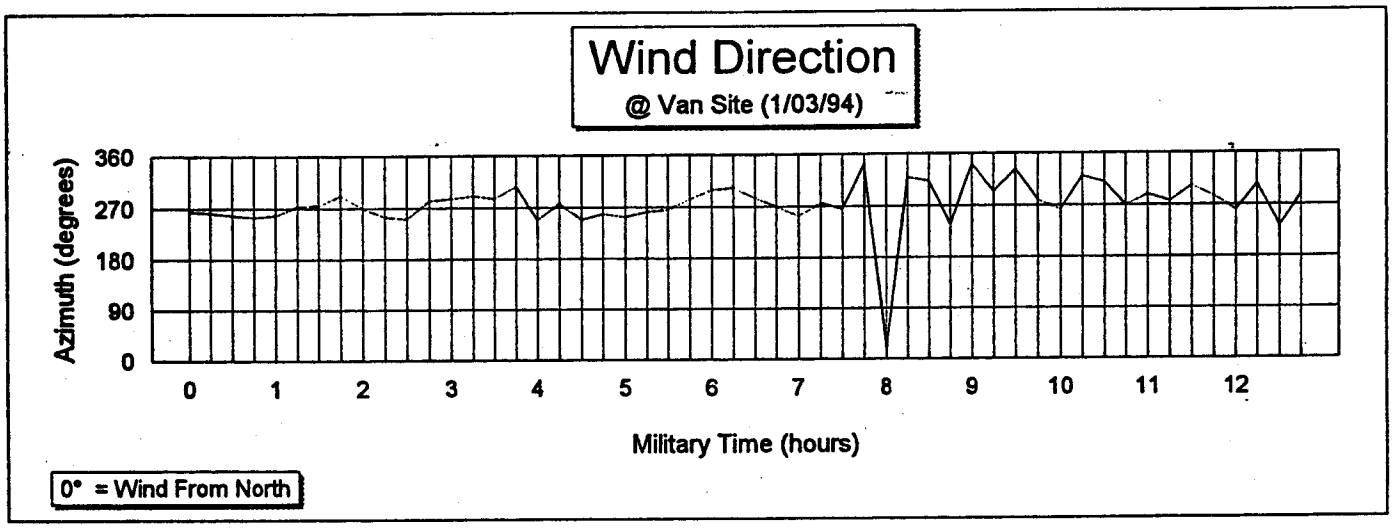

CO Concentrations
@ Van Site (1/01/94)
CO (ppm)
3
2.5
2
1.5
1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
Military Time (hours)

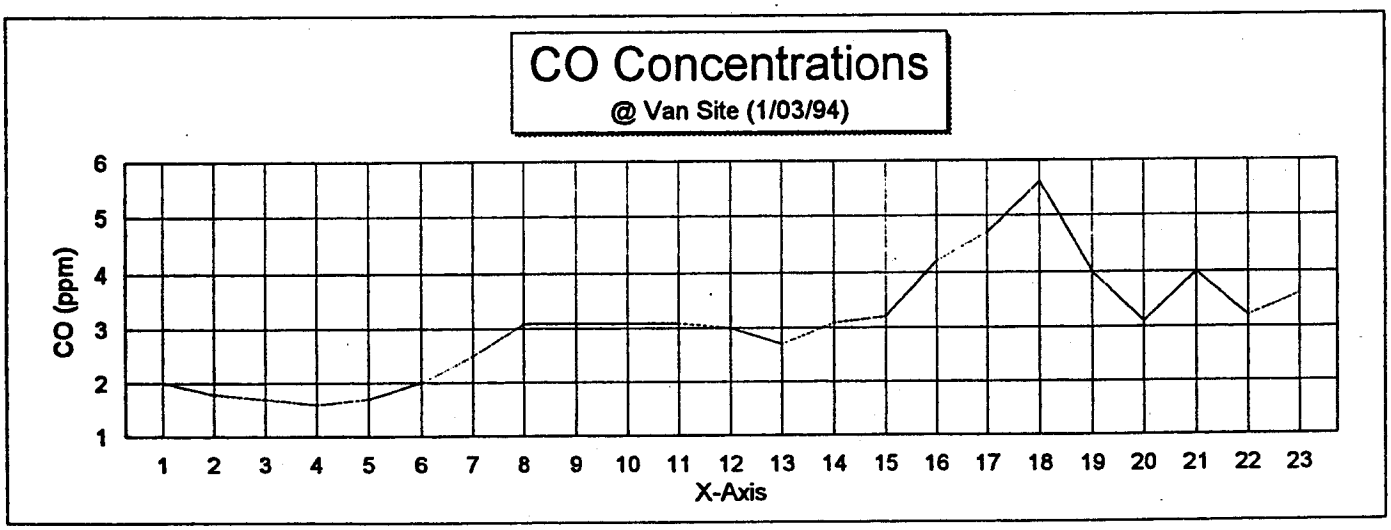

Wind Speed
@ Van Site (1/02/94)
mph
0
2
4
6
8
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
military Time (hours)

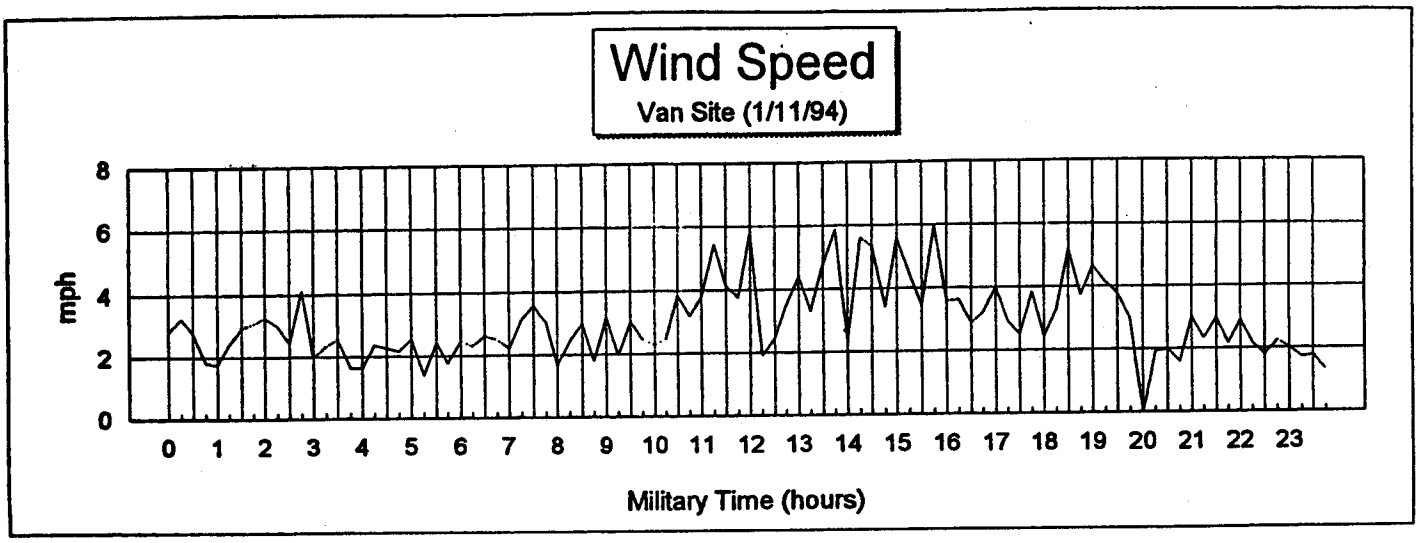

Wind Direction
@ Van Site (1/02/94)
Azimuth (degrees)
0
90
180
270
360
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)
0° = Wind From North

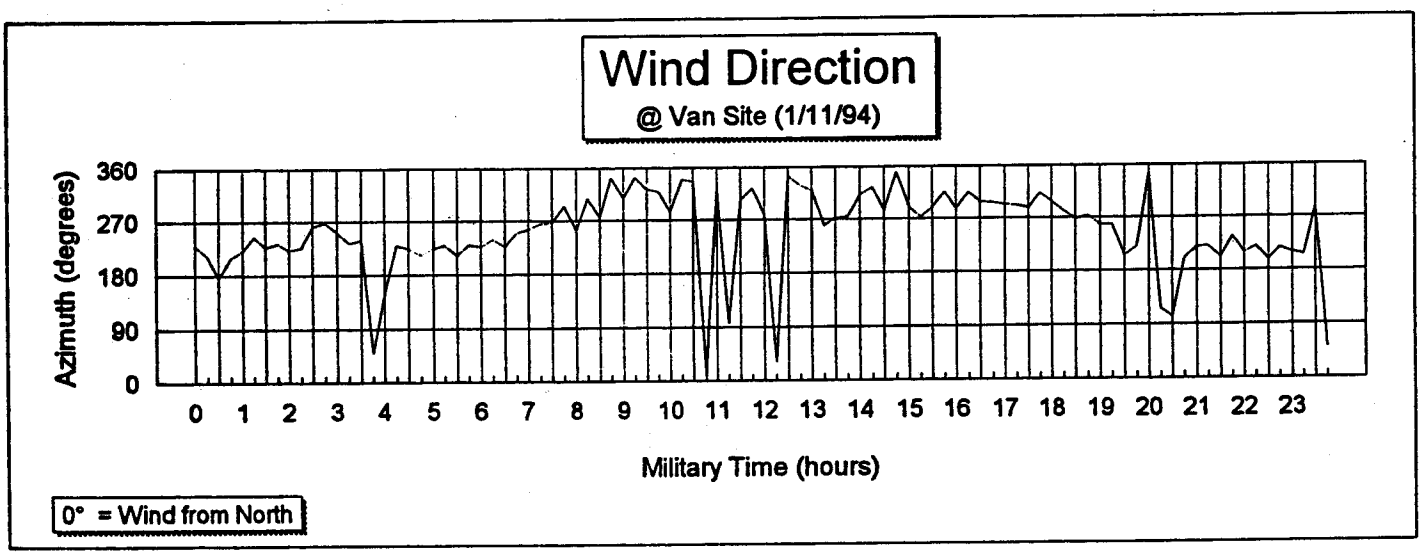

CO Concentrations
@ Van Site (1/02/94)
CO (ppm)
1
2
3
4
5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Military Time (hours)

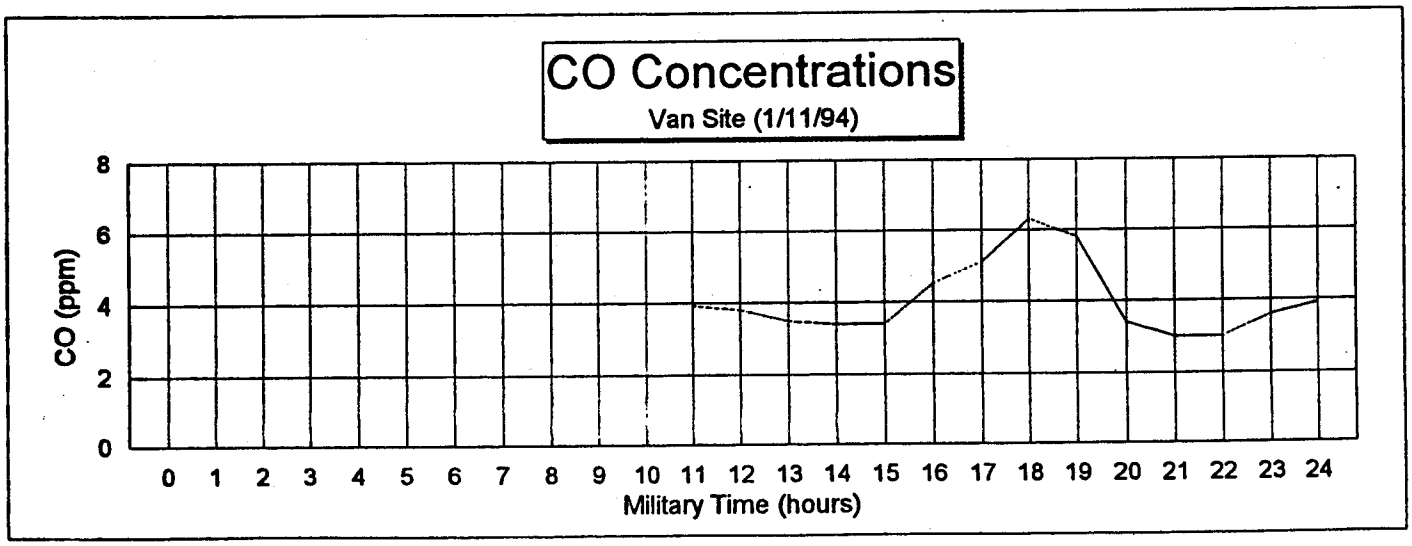

Wind Speed
@ Van Site (1/03/94)
mph
6
5
4
3
2
1
0 1 2 3 4 5 6 7 8 9 10 11 12
Military Time (hours)

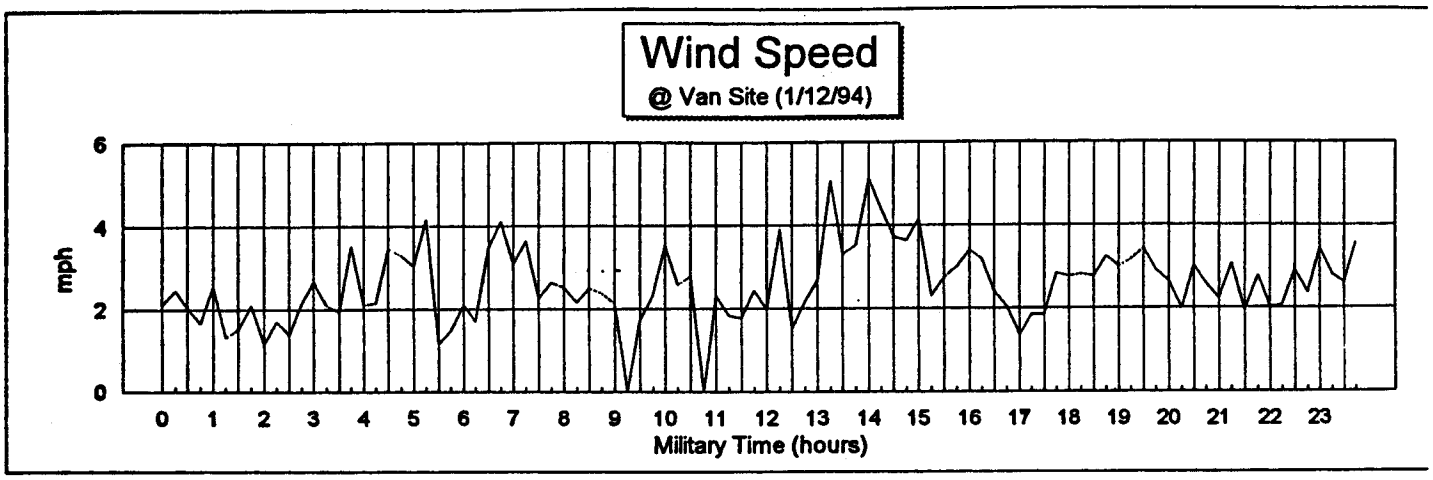

Wind Direction
@ Van Site (1/03/94)
Azimuth (degrees)
360
270
180
90
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Military Time (hours)
0° = Wind From North

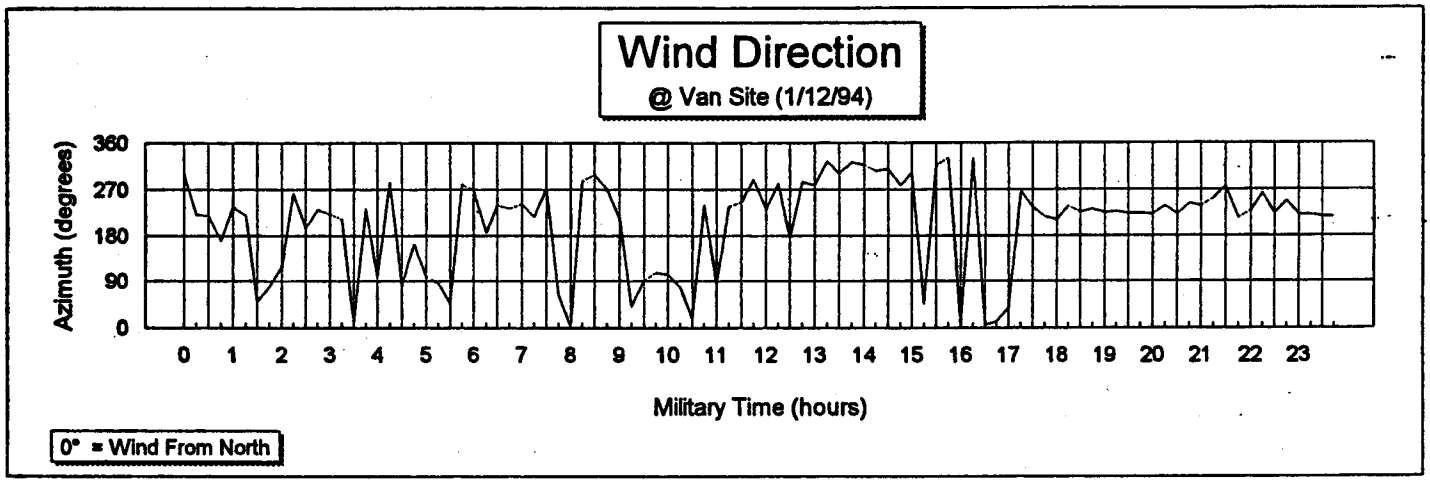

CO Concentrations
@ Van Site (1/03/94)
CO (ppm)
6
5
4
3
2
1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
X-Axis

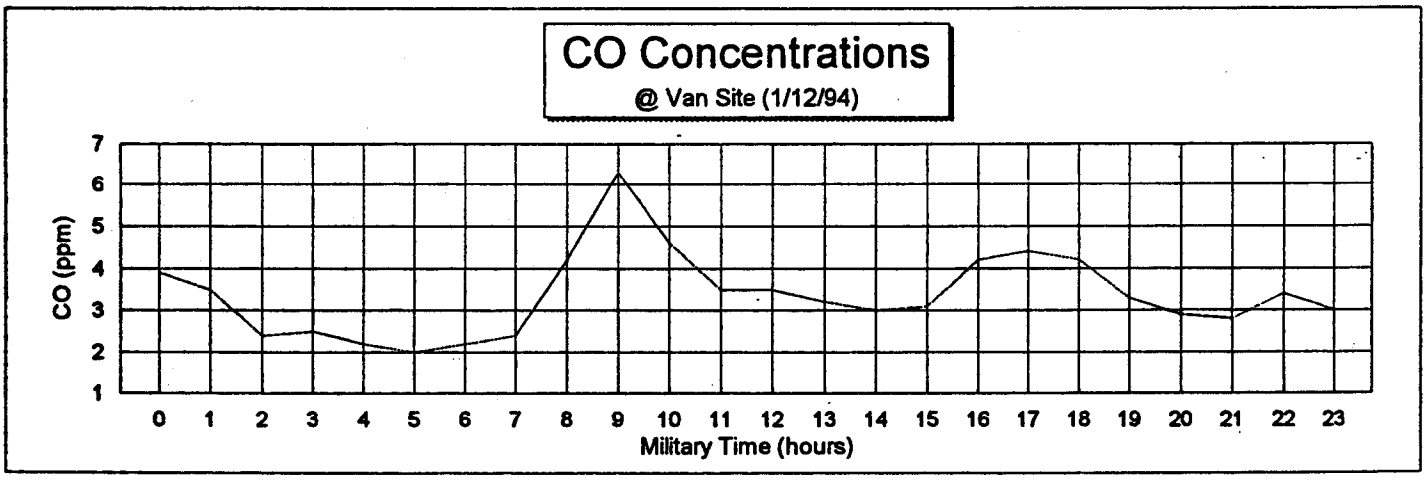

Wind Speed
Van Site (1/11/94)
mph
0
2
4
6
8
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)

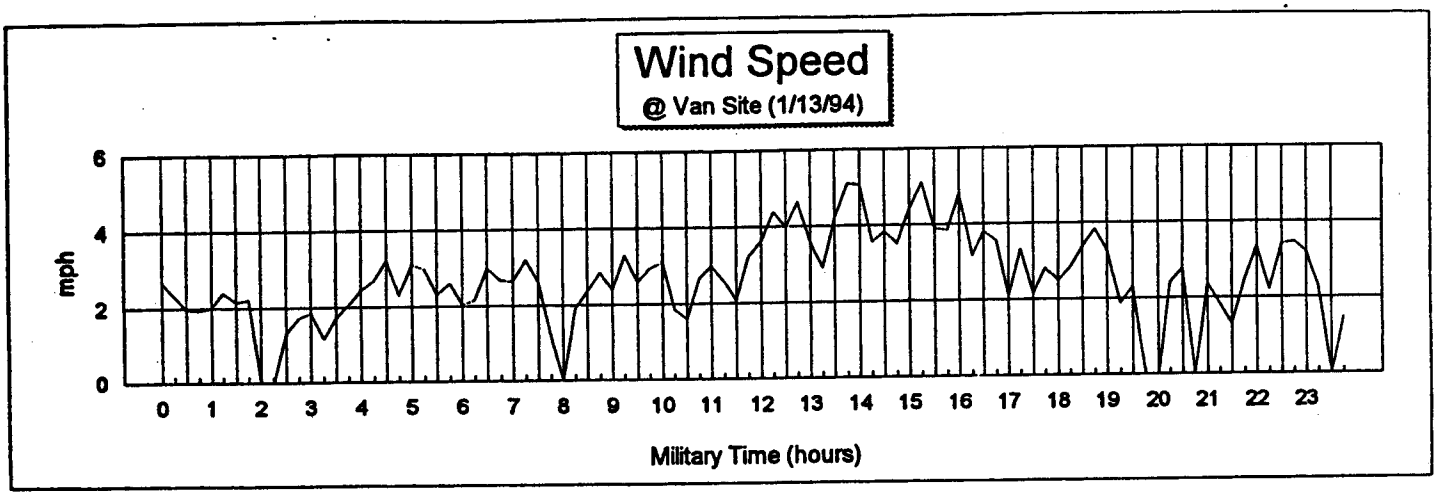

Wind Direction
@ Van Site (1/11/94)
Azimuth (degrees)
0
90
180
270
360
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)
0° = Wind from North

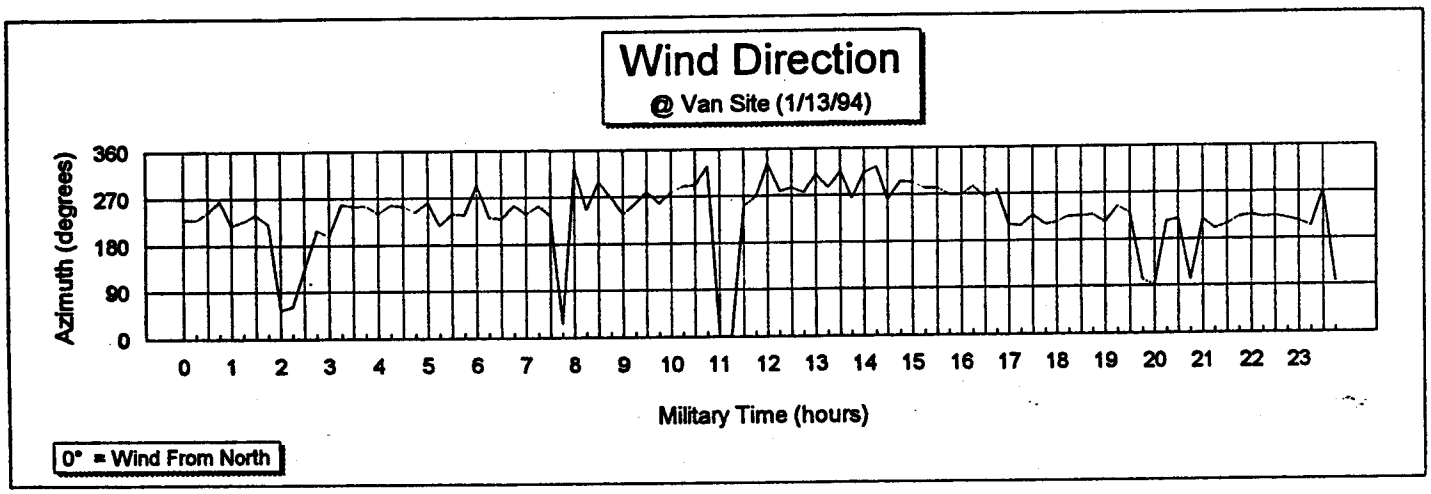

CO Concentrations
Van Site (1/11/94)
CO (ppm)
0
2
4
6
8
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Military Time (hours)

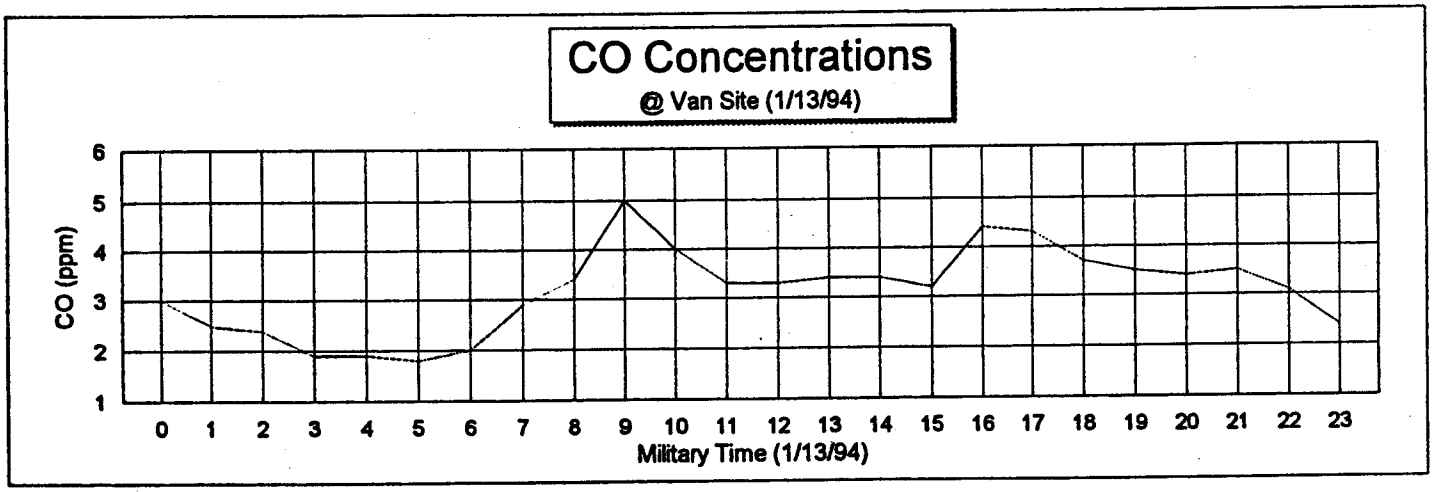

Wind Speed
@ Van Site (1/12/94)
mph
0
2
4
6
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)

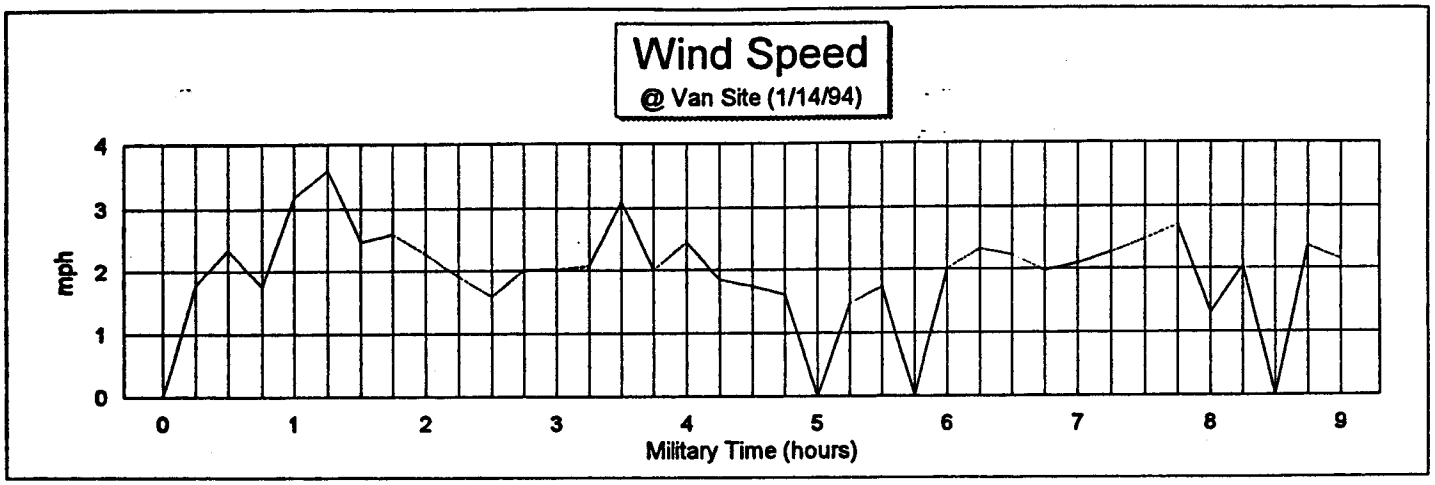

Wind Direction
@ Van Site (1/12/94)
Azimuth (degrees)
0
90
180
270
360
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)
0° = Wind From North

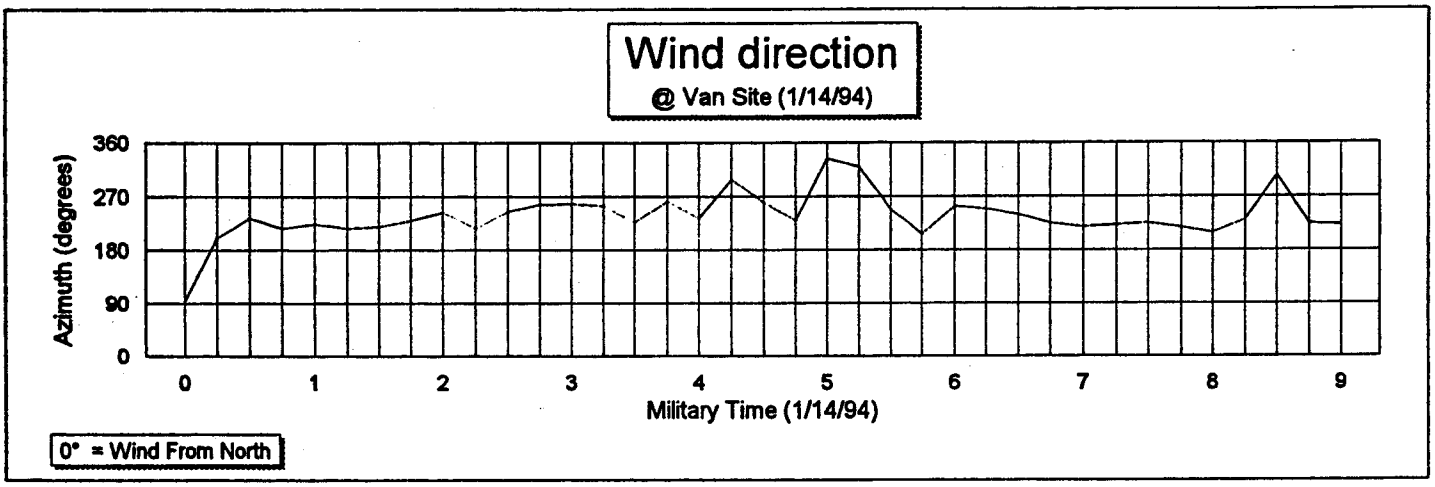

CO Concentrations
@ Van Site (1/12/94)
CO (ppm)
1
2
3
4
5
6
7
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)

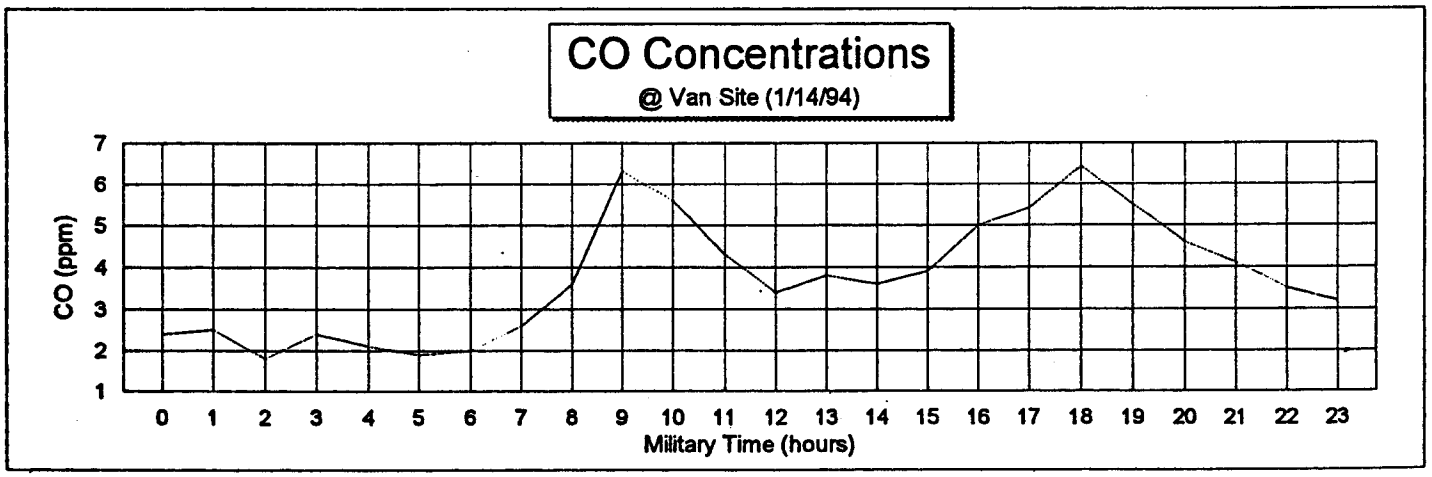

Wind Speed
@ Van Site (1/13/94)
mph
0
2
4
6
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)


Wind Direction
@ Van Site (1/13/94)
Azimuth (degrees)
0
90
180
270
360
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (hours)
0° = Wind From North


CO Concentrations
@ Van Site (1/13/94)
CO (ppm)
1
2
3
4
5
6
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Military Time (1/13/94)


Wind Speed
@ Van Site (1/14/94)
mph
0
1
2
3
4
0
1
2
3
4
5
6
7
8
9
Military Time (hours)


Wind direction
@ Van Site (1/14/94)
Azimuth (degrees)
0
90
180
270
360
0
1
2
3
4
5
6
7
8
9
Military Time (1/14/94)
0° = Wind From North


CO Concentrations
@ Van Site (1/14/94)
CO (ppm)
1
2
3
4
5
6
7
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Military Time (hours)

(1 HOUR RUNNING AVERAGES)

SAROAD CODES

SITE .....7018SJSC | TRANSACTION CODE: 2 | SITE CODE: 005 | PARAMETER CODE: 42101

PARAMETER ....CO | STATE CODE: 05 | AGENCY CODE: I | METHOD CODE: 11

MONTH .....Nov 1993 | AREA CODE: 6980 | PROJECT CODE: 01 | UNIT CODE: 39

UNITS .....PPTM X (10 ^ 0)

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	MAX	RDS
1	21	17	15	13	14	12	25	52	58	19	11	7	5	5	8	10	14	17	21	27	19	32	21	13	19.00	58.00	24
2	9	7	5	6	10	18	41	63	58	39	33	-999	-999	9	10	11	18	28	26	62	59	52	42	31	28.95	63.00	22
3	21	14	11	9	11	15	30	33	42	30	25	24	19	14	15	16	19	24	37	63	54	60	67	34	28.63	67.00	24
4	33	28	31	20	17	21	47	59	49	-999	28	15	15	13	11	11	14	18	15	19	30	37	56	44	27.43	59.00	23
5	28	33	28	20	19	23	31	52	54	29	16	9	7	8	6	8	16	29	34	39	39	44	48	44	27.67	54.00	24
6	32	24	24	18	19	19	17	25	32	27	20	15	13	11	11	14	19	31	38	28	36	32	29	22	23.17	38.00	24
7	21	17	16	13	11	11	12	14	15	16	17	14	13	11	10	12	14	28	28	35	43	49	48	36	21.00	49.00	24
8	30	20	17	15	16	17	26	36	32	29	22	24	24	21	14	17	18	20	22	23	28	35	36	32	23.92	36.00	24
9	23	24	16	13	13	12	14	20	18	13	9	11	14	16	18	16	14	15	13	12	9	8	8	9	14.08	24.00	24
10	9	8	8	7	7	7	9	19	14	-999	6	6	6	7	8	11	13	14	19	11	7	11	13	12	10.09	19.00	23
11	13	12	7	5	7	10	14	24	20	16	12	13	12	10	9	10	11	14	9	7	6	7	5	5	10.75	24.00	24
12	4	4	6	7	8	9	13	15	16	11	7	7	7	7	9	10	13	22	19	20	40	36	25	28	14.29	40.00	24
13	24	18	16	13	15	15	16	17	20	15	10	8	8	8	8	10	12	16	17	29	50	52	24	20	18.38	52.00	24
14	4	3	2	2	2	2	3	3	3	4	6	5	6	6	6	6	8	7	7	11	8	8	9	9	5.42	11.00	24
15	8	6	6	5	7	14	34	64	49	40	26	12	10	10	11	12	17	43	25	25	24	33	29	19	22.04	64.00	24
16	15	12	10	13	13	20	43	48	34	-999	28	23	24	20	20	19	21	18	24	42	38	41	33	23	25.30	48.00	23
17	23	28	27	17	10	10	22	25	23	9	9	8	8	11	7	8	11	13	18	16	15	17	18	23	15.67	28.00	24
18	17	15	17	21	16	13	29	51	34	-999	-999	12	10	11	11	12	16	20	27	26	23	26	41	52	22.73	52.00	22
19	45	37	25	21	15	18	42	76	73	22	16	11	9	10	10	10	16	23	28	35	40	49	38	46	29.79	76.00	24
20	42	32	21	19	18	16	16	29	32	33	26	23	20	17	15	15	23	31	40	38	36	39	33	27	26.71	42.00	24
21	27	29	23	21	19	21	21	31	27	28	29	32	35	39	35	19	22	27	39	39	33	31	33	40	29.17	40.00	24
22	38	41	38	37	36	35	35	50	59	-999	-999	8	13	10	10	10	11	15	18	10	10	15	20	27	24.82	59.00	22
23	18	17	19	8	8	14	42	51	20	12	7	6	8	6	8	10	12	20	24	19	21	31	33	45	19.13	51.00	24
24	47	18	15	10	5	2	4	13	16	9	6	6	7	7	8	10	14	22	25	24	28	38	50	46	17.92	50.00	24
25	28	24	19	19	20	22	17	21	26	21	16	15	12	11	10	10	12	19	24	24	40	44	40	44	22.42	44.00	24
26	36	36	29	27	19	18	22	34	44	27	25	16	15	15	17	17	22	33	36	43	54	43	45	43	29.83	54.00	24
27	41	43	42	40	38	23	18	21	26	30	36	28	24	22	22	23	24	27	27	27	28	30	35	32	29.46	43.00	24
28	37	35	37	39	27	17	13	11	11	18	8	11	13	17	15	15	17	20	14	17	19	19	11	9	18.75	39.00	24
29	7	6	6	6	7	7	9	17	15	-999	9	7	9	11	16	13	13	15	13	12	18	23	10	9	11.22	23.00	23
30	8	7	7	7	6	7	11	21	16	11	8	8	11	12	11	12	17	26	41	35	42	46	34	50	18.92	50.00	24
AVG	24	20	18	16	14	15	23	33	31	21	17	13	13	12	12	13	16	22	24	27	30	33	31	29	21.20		
MAX	47	43	42	40	38	35	47	76	73	40	36	32	35	39	35	23	24	43	41	63	59	60	67	52		76.00	
DAYS	30	30	30	30	30	30	30	30	30	24	28	29	29	30	30	30	30	30	30	30	30	30	30	30			710

STANDARD DEVIATION 13.2

NOTE: -999 INDICATES INVALID DATA OR LESS THAN enough valid DATA INCLUDED

(1 HOUR RUNNING AVERAGES)

SAROAD CODES

SITE .....7018SJSC | TRANSACTION CODE: 2 | SITE CODE: 005 | PARAMETER CODE: 42101
PARAMETER ....CO | STATE CODE: 05 | AGENCY CODE: I | METHOD CODE: 11
MONTH .....Dec 1993 | AREA CODE: 6980 | PROJECT CODE: 01 | UNIT CODE: 39
UNITS .....PPTM X (10 ^ 0)

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	MAX	RDS
1	48	38	26	20	15	15	22	34	34	-999	25	21	15	13	11	15	21	34	38	34	26	41	40	55	27.87	55.00	23
2	50	50	36	28	19	23	32	35	42	31	21	12	11	11	12	16	22	38	60	67	43	51	60	72	35.08	72.00	24
3	71	60	55	49	39	43	63	81	83	29	28	21	19	14	15	17	27	36	29	19	20	28	27	42	38.13	83.00	24
4	28	27	24	18	16	17	20	27	29	11	11	10	8	10	11	12	14	23	32	38	38	45	52	61	24.25	61.00	24
5	49	41	26	18	12	15	21	21	27	25	20	15	14	10	9	11	10	10	13	21	27	28	32	24	20.79	49.00	24
6	19	16	14	11	9	13	17	22	26	-999	9	9	8	11	10	11	15	18	17	22	29	34	30	32	17.48	34.00	23
7	21	11	9	8	8	10	17	21	19	14	9	8	7	7	9	11	11	11	11	7	8	10	7	6	10.83	21.00	24
8	6	6	6	6	6	6	8	11	11	9	9	8	9	8	9	9	10	11	10	10	8	9	8	10	8.46	11.00	24
9	9	7	7	8	9	11	12	15	17	12	9	9	9	10	9	12	14	19	20	17	10	13	13	12	11.79	20.00	24
10	10	10	8	6	7	8	10	15	15	13	11	11	12	8	7	8	9	9	8	7	6	7	6	5	9.00	15.00	24
11	5	5	5	5	5	5	5	8	10	9	12	16	12	9	10	12	12	11	12	10	9	9	12	16	9.33	16.00	24
12	21	21	23	15	16	16	20	24	18	15	10	7	8	8	8	8	12	17	18	17	28	25	20	24	16.63	28.00	24
13	24	20	21	13	11	12	32	51	43	-999	-999	7	8	8	8	8	9	9	9	8	6	6	6	6	14.77	51.00	22
14	6	6	6	6	6	8	13	21	33	-999	-999	-999	-999	-999	-999	8	20	17	25	24	27	27	24	24	16.72	33.00	18
15	11	8	8	10	13	14	27	54	57	30	18	13	11	13	12	14	15	35	41	25	29	29	29	27	22.63	57.00	24
16	21	18	16	13	12	16	34	42	40	29	25	17	13	16	11	12	19	23	28	36	30	43	27	27	23.67	43.00	24
17	29	34	27	21	22	28	34	44	54	36	35	35	31	27	21	19	20	28	24	23	23	24	36	37	29.67	54.00	24
18	49	46	45	43	32	28	34	39	51	61	15	13	12	13	11	15	15	29	33	37	36	43	47	56	33.46	61.00	24
19	46	41	41	27	19	21	29	39	29	23	18	17	15	12	9	9	13	18	24	28	33	39	39	37	26.08	46.00	24
20	38	24	16	14	15	20	45	68	47	-999	29	27	19	12	12	15	16	26	34	37	40	55	44	37	30.00	68.00	23
21	44	51	41	29	20	15	19	33	34	18	22	18	16	13	15	15	21	35	33	55	84	77	68	83	35.79	84.00	24
22	72	42	34	24	20	31	56	91	55	32	27	21	16	10	11	13	19	23	23	24	25	22	23	24	30.75	91.00	24
23	33	39	35	28	25	17	22	36	57	17	11	11	10	10	11	13	19	23	23	21	32	43	33	19	24.50	57.00	24
24	19	15	19	20	18	20	22	31	35	29	27	25	20	15	16	15	18	28	29	41	-999	-999	-999	-999	23.10	41.00	20
25	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	41	55	56	-999.00	56.00	3
26	43	39	42	37	26	32	33	33	33	27	18	19	20	17	16	19	21	22	26	28	33	37	41	33	28.96	43.00	24
27	25	27	25	28	32	37	45	66	65	47	35	30	23	21	22	22	23	39	44	49	41	41	35	30	35.50	66.00	24
28	31	22	20	16	20	19	31	45	48	35	23	17	20	19	15	16	21	32	33	35	54	45	45	40	29.25	54.00	24
29	40	44	37	31	28	24	35	53	54	40	28	20	21	22	18	18	21	25	39	43	51	45	43	37	34.04	54.00	24
30	42	41	30	28	19	20	21	32	45	46	26	18	14	14	13	13	13	16	14	14	17	27	32	43	24.92	46.00	24
31	54	32	18	19	20	14	11	12	15	13	15	17	17	16	19	16	20	32	35	43	40	39	46	46	25.38	54.00	24
AVG	32	28	24	20	17	19	26	37	38	26	20	16	14	13	12	13	17	23	26	28	29	33	33	34	24.16		
MAX	72	60	55	49	39	43	63	91	83	61	35	35	31	27	22	22	27	39	60	67	84	77	68	83		91.00	
DAYS	30	30	30	30	30	30	30	30	30	25	28	29	29	29	29	30	30	30	30	30	29	30	30	30			708

STANDARD DEVIATION 14.9

NOTE: -999 INDICATES INVALID DATA OR LESS THAN enough valid DATA INCLUDED

(1 HOUR RUNNING AVERAGES)

SAROAD CODES

SITE .....7018SJSC — TRANSACTION CODE: 2 — SITE CODE: 005 — PA
PARAMETER ....CO — STATE CODE: 05 — AGENCY CODE: I — ME
MONTH .....Jan 1994 — AREA CODE: 6980 — PROJECT CODE: 01 — UN
UNITS .....PPTM X (10 ^ 0)

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	42	44	36	22	25	27	22	16	12	10	10	9	9	8	9	8	9	13	17	18	19	23	15	11
2	10	9	8	8	9	8	8	9	10	10	10	10	12	12	13	13	14	20	24	19	20	16	17	15
3	12	10	10	12	12	9	12	13	15	16	-999	19	15	14	15	16	20	30	42	45	53	49	33	31
4	28	22	25	23	25	20	19	24	31	33	37	34	29	33	39	40	40	41	46	46	53	49	53	45
5	37	16	12	12	14	20	26	49	68	49	23	9	9	8	9	11	14	17	19	17	18	15	28	26
6	16	10	21	34	32	33	49	86	78	26	12	11	11	9	9	10	14	23	28	24	24	33	43	39
7	23	14	12	10	11	15	43	61	62	49	28	20	18	24	18	17	17	41	46	39	38	46	50	36
8	39	41	35	25	25	23	25	25	24	25	26	25	21	22	15	17	21	34	42	44	39	30	34	33
9	32	37	37	32	28	21	19	12	13	13	11	11	12	10	9	9	10	17	27	54	56	40	52	58
10	51	47	40	33	35	33	51	81	85	52	43	32	17	17	14	13	15	28	41	38	55	59	43	28
11	21	36	33	28	18	25	30	32	35	29	21	17	16	15	14	15	17	21	27	33	41	51	54	48
12	47	32	23	18	15	18	35	42	60	-999	36	22	20	16	16	17	21	35	46	30	31	43	41	41
13	41	40	31	19	19	25	42	65	83	46	39	30	24	21	20	18	21	33	44	43	53	42	33	28
14	27	24	19	21	26	35	64	101	110	89	50	42	31	26	26	30	36	47	87	102	89	60	55	53
15	36	43	47	37	30	29	25	30	30	40	32	28	25	21	19	18	20	30	57	46	60	61	66	54
16	44	35	29	31	29	26	28	30	31	30	30	21	15	12	11	10	11	21	27	17	25	47	55	59
17	40	31	25	22	22	23	35	54	60	37	32	28	21	23	19	21	25	40	41	43	44	54	36	31
18	27	26	18	15	17	21	44	85	75	56	54	41	29	27	18	23	28	40	54	64	47	58	46	41
19	44	37	33	26	21	24	44	45	75	45	36	30	28	27	21	26	29	37	64	71	61	50	42	33
20	32	24	21	17	15	18	23	32	35	-999	25	28	26	25	21	19	17	30	34	38	48	51	28	26
21	12	7	12	15	17	20	36	47	32	18	8	6	8	10	15	16	21	31	35	31	39	38	51	45
22	42	25	22	19	15	14	9	19	22	14	19	20	20	20	17	15	4	4	10	6	4	5	7	4
23	4	3	3	3	3	3	3	7	8	6	4	4	4	5	5	4	5	8	7	11	10	6	4	4
24	4	3	3	3	3	3	6	8	11	9	13	11	11	13	8	7	6	13	15	10	19	19	13	11
25	8	7	6	6	5	5	8	12	11	9	7	7	7	6	6	8	9	11	10	9	9	9	10	11
26	11	7	7	6	6	8	33	46	41	22	18	11	9	10	8	7	9	12	13	12	14	15	17	12
27	5	5	5	5	6	6	8	16	19	12	9	8	8	8	8	7	8	14	16	16	17	16	21	27
28	24	21	22	17	14	15	22	42	47	44	26	13	15	13	11	10	11	15	15	19	20	26	31	37
29	19	20	17	12	13	15	22	22	22	19	17	12	12	10	9	8	9	11	16	19	33	35	41	36
30	28	17	13	12	11	9	15	17	17	16	13	13	10	9	9	7	8	12	17	21	18	24	31	45
31	44	32	12	8	8	10	18	23	36	-999	20	19	16	16	14	13	14	24	26	27	30	35	29	34
AVG	27	23	21	18	17	18	27	37	41	29	24	19	16	16	14	15	16	24	32	33	35	36	35	32
MAX	51	47	47	37	35	35	64	101	110	89	54	42	31	33	39	40	40	47	87	102	89	61	66	59
DAYS	31	31	31	31	31	31	31	31	31	28	30	31	31	31	31	31	31	31	31	31	31	31	31	31

STANDARD DEVIATION 16.9

NOTE: -999 INDICATES INVALID DATA OR LESS THAN enough valid DATA INCLUDED

February 1994
STATION NO. 7018 POLLUTANT: CO : ppm
San Jose - Burbank

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.6	2.0	1.8	1.4	1.3	2.1	3.3	5.5	4.3	3.9			2.1	2.0	2.1	2.2	1.7	1.9	1.9	1.9	2.5	2.7	2.7	3.1
2	3.0	3.2	2.3	2.0	1.8	2.4	4.5	6.8	7.3	5.0			2.4	2.3	2.1	2.3	2.7	3.9	4.2	4.1	3.7	3.2	2.6	3.0
3	2.7	2.5	2.0	2.0	1.9	2.4	3.5	5.1	4.5	4.6	3.8	3.1	2.6	1.9	1.3	1.4	1.5	1.8	1.9	1.8	2.4	3.1	3.8	2.9
4	1.9	1.9	1.8	1.5	1.8	1.9	2.9	5.5	5.4	3.9	3.4	2.1	1.5	1.3	0.9	0.8	0.7	1.6	2.8	2.8	2.9	3.1	2.7	2.1
5	1.7	1.3	1.1	1.0	0.8	0.7	0.8	1.1	1.2	1.0	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.7	1.3	2.6	3.2	2.1	0.7	0.6
6	0.7	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.6	0.7	0.5	0.6	0.6	0.5	0.6	0.7	0.9	1.3	0.9	0.8	0.5	0.4	0.4
7	0.4	0.4	0.4	0.3	0.4	0.5	0.8	1.6	2.4	1.5	0.7	0.6	0.5	0.9	1.2	1.3	1.5	2.2	1.9	1.6	1.5	1.5	1.3	0.9
8	0.6	0.4	0.4	0.4	0.4	0.5	1.3	3.0	2.3	2.0	1.4	1.2	1.0	0.9	1.0	0.9	1.0	1.7	3.1	3.2	3.0	2.6	2.7	2.8
9	2.6	1.7	1.2	1.1	1.1	1.2	2.2	3.1	2.5		1.0	0.9	1.0	1.0	1.1	0.9	0.8	0.8	1.4	2.0	2.3	2.8	4.8	3.0
10	2.3	1.8	1.4	0.9	0.9	0.9	1.6	1.9	1.6	1.0	0.7	0.7	0.9	0.9	0.8	0.8	0.9	1.0	1.1	0.9	0.7	0.8	0.9	0.9
11	0.6	0.5	0.6	0.6	0.8	0.8	3.0	4.4	2.7	1.3	0.8	0.7	0.8	0.8	0.8	0.7	0.7	0.9	1.3	1.4	1.3	1.6	1.7	1.6
12	2.0	2.7	2.6	2.2	1.3	1.0	1.7	2.0	2.1	1.5	1.6	1.4	1.3	1.0	1.0	1.0	1.0	1.5	3.1	2.8	2.5	2.3	2.7	2.4
13	2.4	2.9	3.1	2.8	2.5	1.9	2.1	3.3	2.1	1.4	1.5	1.5	1.2	1.0	1.0	1.0	1.0	1.0	1.6	3.3	4.4	2.7	2.6	4.6
14	3.2	3.1	2.8	1.8	1.4	2.0	5.1	6.6	6.4	3.6	2.3	2.0	1.7	1.4	1.3	1.2	1.3	1.7	1.6	1.4	1.3	2.6	3.4	2.2
15	2.4	1.3	1.4	1.1	0.8	1.0	1.4	1.5	1.3	1.7	1.9	1.8	2.0	2.1	2.0	2.1	2.3	2.7	2.8	3.1	3.9	4.6	2.6	1.5
16	0.8	0.9	1.0	0.6	0.7	0.8	1.3	1.5	1.5	1.2		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
17	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.6	0.7	0.7	0.8	0.6	0.7	0.9	1.1	1.5	2.0	1.5	1.4	0.9	0.9
18	1.1	0.7	0.9	0.7	0.6	1.0	1.7	1.8	1.5	1.0	1.5	1.2	1.2	1.0	1.1	1.0	0.9	1.2	1.3	2.1	2.5	2.6	1.5	1.3
19	1.4	1.3	0.9	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.9	0.8	0.9	0.7	0.7	0.7	0.8	1.1	1.7
20	1.7	1.4	1.5	1.2	1.0	0.9	1.0	1.1	0.9	0.8	0.7	0.8	0.8	0.7	1.1	1.1	0.9	0.9	1.2	1.4	1.9	1.4	1.8	1.4
21	1.4	1.4	1.0	0.9	0.7	0.8	0.9	1.2	1.1	0.9	1.0	0.9	0.8	1.0	1.0	0.8	0.8	1.0	1.2	1.2	1.2	1.7	3.0	2.7
22	2.7	2.0	1.9	1.9	1.7	2.1	5.7	8.6	4.3		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.3	1.5	1.8	2.1	2.9	3.6
23	4.0	3.1	1.8	1.0	1.1	1.5	2.7	2.8	3.4	3.4			1.8	1.6	1.1	1.0	1.0	1.6	1.8	1.2	1.6	2.7	4.0	3.3
24	2.6	1.8	2.0	1.6	1.6	2.1	3.5	4.8	4.1	2.1	1.8	2.0	1.7	1.2	1.1	1.3	1.3	1.5	1.7	1.8	1.9	1.7	2.1	1.3
25	1.3	1.8	2.0	2.0	1.6	1.7	1.6	2.2	2.5	1.8	2.0	2.1	2.2	1.8	1.3	1.3	1.2	1.3	1.5	1.4	1.3	1.3	1.1	1.1
26	0.9	0.8	0.7	0.7	0.6	0.6	0.7	0.8	0.9	1.0	1.0	1.0	1.4	1.1	1.1	0.9	0.9	1.2	1.2	0.9	0.8	0.8	0.9	0.9
27	0.9	1.1	1.3	1.1	1.1	1.0	0.9	0.9	1.1	1.2	1.1	1.0	0.8	0.8	0.9	0.8	0.8	0.9	1.0	1.0	0.9	1.1	1.1	0.9
28	0.9	0.8	0.7	0.7	0.8	1.2	2.2	2.3	1.6	1.8	1.4	1.1	0.9	0.9	1.1	0.9	1.0	1.4	1.9	1.9	2.0	2.5	3.2	3.5

(1 HOUR RUNNING AVERAGES)

SAROAD CODES

SITE .....7009SJ4T | TRANSACTION CODE: 2 | SITE CODE: 004 | PARAMETER CODE: 42101
PARAMETER ....CO | STATE CODE: 05 | AGENCY CODE: I | METHOD CODE: 11
MONTH .....Nov 1993 | AREA CODE: 6980 | PROJECT CODE: 01 | UNIT CODE: 39
UNITS .....PPTM X (10 ** 0)

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	MAX	RDS
1	26	24	24	19	13	17	29	32	45	15	11	12	-999	-999	7	6	12	10	17	19	28	34	19	22	20.05	45.00	22
2	32	24	23	18	15	17	32	47	39	22	20	14	13	7	7	9	13	24	14	25	40	59	50	28	24.67	59.00	24
3	24	24	17	10	19	26	22	38	34	29	24	23	23	13	12	13	17	22	25	33	55	56	60	68	28.63	68.00	24
4	36	23	26	15	22	31	38	47	38	38	21	14	14	10	9	10	14	19	16	16	24	41	53	58	26.38	58.00	24
5	51	33	34	23	28	27	38	51	35	33	32	14	-999	8	8	10	16	35	34	63	77	76	57	64	36.83	77.00	23
6	57	36	36	41	31	23	30	27	22	22	19	15	13	9	10	11	14	25	51	57	88	52	31	32	31.33	88.00	24
7	25	24	21	19	18	10	13	15	13	13	11	12	10	9	10	9	11	23	26	26	18	24	43	31	18.08	43.00	24
8	23	28	23	11	11	18	25	36	32	23	17	-999	19	16	13	14	16	18	21	18	24	24	22	15	20.30	36.00	23
9	14	13	12	11	10	9	15	24	20	14	11	11	11	14	15	13	13	13	12	11	9	9	7	7	12.42	24.00	24
10	8	7	7	7	7	8	9	12	13	11	-999	-999	-999	-999	10	14	20	16	14	10	8	10	14	12	10.85	20.00	20
11	14	16	12	8	7	8	19	27	20	14	-999	-999	9	10	9	9	9	11	9	7	7	7	7	6	11.14	27.00	22
12	6	7	7	6	7	9	13	16	16	13	-999	-999	7	8	8	9	12	16	15	19	23	44	32	46	15.41	46.00	22
13	42	24	22	21	15	13	17	19	20	21	14	8	8	9	8	9	11	14	16	19	17	26	20	17	17.08	42.00	24
14	6	6	5	5	5	5	5	5	6	6	6	6	5	6	6	5	6	6	8	8	7	7	6	8	6.00	8.00	24
15	7	11	14	13	12	17	26	50	42	29	22	21	14	11	10	10	17	58	60	76	80	35	29	37	29.21	80.00	24
16	26	15	11	11	10	18	27	35	30	23	27	27	-999	19	18	21	22	31	37	46	27	20	19	16	23.30	46.00	23
17	14	23	22	19	13	12	18	27	20	12	9	10	11	9	9	11	-999	-999	-999	-999	14	12	13	18	14.80	27.00	20
18	18	14	20	21	15	15	25	26	28	26	15	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999.00	28.00	11
19	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999.00	-999.00	0
20	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999.00	-999.00	0
21	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999.00	-999.00	0
22	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999.00	-999.00	0
23	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999.00	-999.00	0
24	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	8	12	19	17	21	31	56	57	49	-999.00	57.00	9
25	46	43	44	23	24	19	24	29	18	14	14	10	11	9	8	7	10	14	18	24	36	36	32	30	22.63	46.00	24
26	34	35	42	39	18	23	30	30	21	19	17	16	13	11	12	13	17	27	29	54	68	41	48	58	29.79	68.00	24
27	49	60	56	40	29	28	28	34	31	32	38	26	20	20	18	18	20	26	27	28	26	28	38	37	31.54	60.00	24
28	37	36	35	38	24	20	12	9	12	10	8	9	14	16	16	13	18	12	13	16	13	8	6	5	16.67	38.00	24
29	5	5	4	4	4	5	7	11	11	8	9	10	11	-999	-999	-999	13	10	10	11	14	6	6		8.33	14.00	21
30	5	4	4	4	4	5	10	18	11	8	9	7	-999	8	7	9	14	17	16	16	19	30	56	48	14.30	56.00	23
AVG	25	22	22	18	15	16	21	28	24	19	-999	-999	-999	-999	-999	11	-999	20	22	27	31	31	30	30	20.78		
MAX	57	60	56	41	31	31	38	51	45	38	38	27	23	20	18	21	22	58	60	76	88	76	60	68		88.00	
DAYS	24	24	24	24	24	24	24	24	24	24	21	19	18	21	22	23	22	23	23	23	24	24	24	24			551

STANDARD DEVIATION 14.3

NOTE: -999 INDICATES INVALID DATA OR LESS THAN enough valid DATA INCLUDED

(1 HOUR RUNNING AVERAGES)

SAROAD CODES

SITE .....7009SJ4T TRANSACTION CODE: 2 SITE CODE: 004 PARAMETER CODE: 42101

PARAMETER ....CO STATE CODE: 05 AGENCY CODE: I METHOD CODE: 11

MONTH .....Dec 1993 AREA CODE: 6980 PROJECT CODE: 01 UNIT CODE: 39

UNITS .....PPTM X (10 ^ 0)

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	MAX	RDS
1	39	46	28	23	15	18	27	41	51	34	31	20	-999	9	10	13	16	21	19	20	18	20	17	22	24.26	51.00	23
2	16	14	12	11	12	16	28	32	28	27	18	12	-999	9	10	13	23	37	36	44	43	61	67	62	27.43	67.00	23
3	51	41	41	40	40	41	52	91	98	68	31	15	-999	9	10	13	21	34	31	14	15	22	40	45	37.52	98.00	23
4	34	28	23	22	17	16	18	24	22	7	7	5	5	6	6	6	7	10	11	16	29	42	55	60	19.83	60.00	24
5	47	47	44	39	37	12	19	21	25	22	17	11	11	9	7	7	6	7	11	10	15	25	34	24	21.13	47.00	24
6	33	24	17	19	14	17	16	18	20	14	11	8	-999	7	6	8	11	13	16	19	28	33	50	34	18.96	50.00	23
7	33	18	15	7	6	8	11	19	21	11	10	9	-999	8	8	9	11	13	14	10	8	7	6	5	11.61	33.00	23
8	3	3	3	3	3	4	6	9	9	9	7	9	-999	10	8	10	15	11	10	9	7	8	7	6	7.35	15.00	23
9	7	4	4	4	4	5	12	18	18	12	-999	-999	-999	12	10	12	17	17	17	18	18	15	14	10	11.81	18.00	21
10	11	7	6	5	5	6	9	17	18	12	11	13	-999	8	8	8	11	15	8	9	8	8	7	5	9.35	18.00	23
11	4	5	4	4	3	3	4	6	8	8	9	12	9	9	9	6	6	7	6	6	6	6	7	9	6.50	12.00	24
12	11	16	36	25	18	18	21	21	19	16	6	5	6	5	5	6	10	13	15	18	29	32	37	21	17.04	37.00	24
13	18	22	27	14	11	14	18	24	27	14	9	9	-999	-999	7	8	10	13	9	7	6	6	5	5	12.86	27.00	22
14	4	4	4	4	4	5	11	22	30	23	15	7	-999	-999	7	9	14	20	19	23	30	34	36	29	16.09	36.00	22
15	21	12	10	10	11	13	32	67	64	43	19	12	-999	9	8	10	15	37	36	47	48	33	31	34	27.04	67.00	23
16	31	24	20	11	9	12	19	32	35	24	13	10	-999	11	10	11	16	19	22	27	34	38	46	28	21.83	46.00	23
17	33	36	33	35	25	34	40	42	41	42	39	41	-999	17	14	16	18	28	22	18	19	32	53	54	31.83	54.00	23
18	47	44	36	27	28	37	28	27	49	32	21	12	10	9	9	9	11	20	44	68	49	52	49	45	31.79	68.00	24
19	70	49	42	45	34	39	29	27	35	25	18	14	13	9	7	5	7	11	14	24	47	46	58	31	29.13	70.00	24
20	28	21	20	16	24	27	41	48	72	37	31	19	-999	12	9	10	14	24	32	31	57	76	71	72	34.43	76.00	23
21	60	34	34	37	22	19	17	22	24	21	20	17	-999	11	11	13	19	36	36	53	65	59	49	63	32.26	65.00	23
22	49	51	46	41	41	36	64	78	53	32	34	33	22	12	9	11	18	22	20	20	18	25	27	37	33.29	78.00	24
23	41	30	34	33	25	23	37	49	50	47	35	19	12	8	12	16	18	25	27	39	69	62	56	47	33.92	69.00	24
24	32	27	29	24	19	21	28	41	49	53	36	34	31	24	23	22	25	27	43	41	69	54	63	67	36.75	69.00	24
25	80	53	38	35	41	29	24	24	23	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999.00	80.00	9
26	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999.00	-999.00	0
27	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999.00	-999.00	0
28	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999.00	-999.00	0
29	60	60	40	30	30	30	40	50	60	40	38	29	-999	22	17	20	23	31	36	49	64	66	48	63	41.13	66.00	23
30	55	50	36	29	34	25	29	38	43	34	30	20	-999	17	10	10	12	13	11	11	12	16	31	47	26.65	55.00	23
31	33	36	35	30	25	10	11	11	12	14	13	12	-999	12	11	12	15	22	28	43	52	55	36	41	24.74	55.00	23
AVG	34	29	26	22	20	19	25	33	36	27	20	16	-999	11	10	11	14	20	22	26	32	35	37	36	24.24		
MAX	80	60	46	45	41	41	64	91	98	68	39	41	31	24	23	22	25	37	44	68	69	76	71	72		98.00	
DAYS	28	28	28	28	28	28	28	28	28	27	26	26	9	25	27	27	27	27	27	27	27	27	27	27			635

STANDARD DEVIATION 16.9

NOTE: -999 INDICATES INVALID DATA OR LESS THAN enough valid DATA INCLUDED

(1 HOUR RUNNING AVERAGES)

SAROAD CODES

SITE .....7009SJ4T | TRANSACTION CODE: 2 | SITE CODE: 004 | PARAMETER CODE: 42101
PARAMETER ....CO | STATE CODE: 05 | AGENCY CODE: 1 | METHOD CODE: 11
MONTH .....Jan 1994 | AREA CODE: 6980 | PROJECT CODE: 01 | UNIT CODE: 39
UNITS .....PPTH X (10 ^ 0)

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	MAX	RDS
1	56	52	34	32	29	31	15	10	8	7	7	9	-999	7	6	6	7	12	14	14	14	13	13	10	17.65	56.00	23
2	9	9	8	9	8	9	9	9	11	8	8	8	-999	10	10	11	12	16	19	14	15	15	13	14	11.04	19.00	23
3	12	11	12	11	11	10	8	11	12	13	17	15	-999	13	12	14	15	28	42	39	47	52	49	58	22.26	58.00	23
4	32	34	28	36	36	25	21	24	28	36	35	41	-999	30	39	38	42	55	45	49	52	52	57	55	38.70	57.00	23
5	41	16	13	11	12	20	33	29	24	21	14	8	-999	8	9	11	13	18	25	21	22	39	68	65	23.52	68.00	23
6	57	49	31	30	22	22	37	69	100	58	16	10	-999	8	8	10	13	21	24	29	47	55	50	24	34.35	100.00	23
7	14	17	16	13	14	14	35	37	48	47	32	15	-999	21	15	15	19	44	52	39	29	54	54	62	30.70	62.00	23
8	49	60	26	18	17	13	25	21	18	20	16	16	15	18	16	14	16	30	37	51	41	36	41	39	27.21	60.00	24
9	33	42	45	37	25	22	16	10	10	10	8	7	7	7	6	7	8	13	24	30	40	57	51	58	23.88	58.00	24
10	50	49	41	35	28	29	34	53	61	54	34	28	-999	16	11	10	14	28	36	39	57	73	63	46	38.65	73.00	23
11	40	35	29	28	26	22	28	40	42	26	13	16	-999	11	11	12	15	23	30	43	53	53	49	51	30.26	53.00	23
12	51	32	33	23	17	18	27	51	78	45	29	19	-999	13	13	13	20	39	57	85	96	49	56	35	39.09	96.00	23
13	32	31	20	19	33	25	39	71	83	47	-999	-999	27	21	20	17	25	50	84	107	61	34	34	34	41.55	107.00	22
14	30	21	26	21	22	24	40	77	59	44	52	41	-999	24	20	22	34	60	73	83	93	72	96	70	48.00	96.00	23
15	78	79	64	54	39	40	45	33	42	35	32	26	17	14	10	11	15	25	37	54	62	79	75	68	43.08	79.00	24
16	35	47	52	50	33	37	28	29	35	27	22	17	8	6	5	5	6	9	13	23	57	63	63	57	30.29	63.00	24
17	38	45	19	24	26	31	31	52	40	40	28	14	14	11	12	14	20	40	33	55	78	38	33	32	32.00	78.00	24
18	30	23	20	18	16	19	45	51	67	52	44	38	33	18	12	-999	-999	51	48	85	94	61	31	30	40.27	94.00	22
19	29	22	19	19	16	17	41	69	66	52	36	30	-999	18	16	22	25	40	49	57	95	57	43	48	38.52	95.00	23
20	30	12	9	9	8	9	15	24	30	25	17	24	30	28	23	23	20	27	27	36	45	28	12	7	21.58	45.00	24
21	7	6	7	10	8	9	14	18	16	14	-999	-999	9	7	10	16	22	37	27	28	40	76	89	86	25.27	89.00	22
22	32	39	28	22	18	10	10	14	16	17	19	14	16	17	16	15	7	7	12	8	7	6	6	5	15.04	39.00	24
23	4	4	4	3	2	2	3	6	8	5	5	4	4	4	4	4	6	8	10	8	9	6	5	3	5.04	10.00	24
24	3	3	3	3	3	3	5	7	10	9	11	11	-999	7	8	7	8	14	15	10	16	16	11	9	8.35	16.00	23
25	6	6	7	4	4	6	7	11	12	9	8	11	11	10	11	15	13	15	14	10	9	8	9	6	9.25	15.00	24
26	6	6	5	5	5	7	17	43	39	21	16	11	-999	6	6	6	8	13	11	9	8	13	13	8	12.26	43.00	23
27	4	4	5	4	4	6	9	13	13	9	8	7	-999	7	6	6	5	7	8	8	12	15	29	28	9.43	29.00	23
28	36	27	25	21	11	13	20	51	36	26	20	11	10	10	9	8	11	16	17	19	34	40	47	33	22.96	51.00	24
29	38	25	20	14	14	17	16	25	28	31	16	12	11	8	6	6	8	9	10	17	26	47	43	35	20.08	47.00	24
30	33	28	25	14	10	9	16	20	13	13	12	11	8	7	6	6	6	9	11	14	17	22	24	23	14.88	33.00	24
31	28	34	35	24	18	22	38	59	58	31	22	20	-999	-999	13	16	18	32	36	29	38	60	43	34	32.18	60.00	22
AVG	30	28	23	20	17	17	23	33	36	27	21	17	-999	13	12	13	15	26	30	36	42	42	41	37	25.93		
MAX	78	79	64	54	39	40	45	77	100	58	52	41	33	30	39	38	42	60	84	107	96	79	96	86		107.00	
DAYS	31	31	31	31	31	31	31	31	31	31	29	29	15	30	31	30	30	31	31	31	31	31	31	31			721

STANDARD DEVIATION 19.6

NOTE: -999 INDICATES INVALID DATA OR LESS THAN enough valid DATA INCLUDED

February 1994
STATION NO. 7009 POLLUTANT: CO : ppm
San Jose - 4th St. Station

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.6	3.2	3.1	1.7	1.6	2.9	4.1	6.5	5.5	4.5	2.6	2.4		2.0	2.0	2.5	2.3	2.4	2.1	2.1	2.3	2.8	3.3	5.1
2	4.4	3.5	2.9	2.1	1.6	3.0	3.4	4.2	4.7	3.5	3.3	2.6		2.2	2.1	1.9	2.2	4.1	3.5	3.9	4.8	4.9	3.2	3.7
3	3.4	3.3	3.0	2.7	2.8	3.4	3.1	4.3	4.5	3.5	3.6	3.4	2.7	2.1	1.5	1.5	1.8	2.1	2.0	1.9	2.1	2.2	3.4	3.6
4	3.0	2.9	2.5	1.7	2.5	2.1	2.3	5.3	5.0	4.0	2.5	1.9	1.5	1.3	1.0	0.9	1.1	1.8	2.6	3.5	5.0	4.0	3.2	3.5
5	3.1	2.3	1.9	1.0	0.8	0.8	0.9	1.3	1.4	1.3	1.1	1.0	1.0	0.9	0.8	0.9	0.9	1.0	1.7	2.4	2.8	1.4	1.0	0.8
6	0.9	0.9	0.8	0.6	0.5	0.5	0.5	0.6	0.8	1.0	1.0	0.9	1.1	1.0	1.0	1.0	1.1	1.4	1.2	1.0	1.0	0.8	0.6	0.6
7	0.5	0.6	0.5	0.5	0.5	0.6	1.1	1.5	2.4	1.6	0.9	0.9	1.1	1.5		1.8	1.9	2.3	1.7	1.4	1.1	1.5	1.5	0.9
8	0.8	0.5	0.5	0.5	0.5	0.6	1.0	2.1	2.3	2.4	1.4	1.1	0.9	0.9	0.8	0.7		1.5	2.0	1.9	3.1	4.0	3.5	2.8
9	2.1	3.1	1.9	1.2	1.0	1.1	1.9	2.7	2.4	1.4	1.2	1.2							2.0	2.0	2.0	2.0	2.0	3.0
10	3.0	2.0	1.0	2.0	1.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
11	1.0	1.0	1.0	0.0	1.0	1.0	4.0	8.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0
12	2.0	3.0	3.0	2.0	2.0	1.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3.0	3.0	3.0	2.0	3.0	4.0
13	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	3.0	3.0	2.0	5.0
14	4.0	4.0	3.0	3.0	3.0	2.0	4.0	6.0	5.0	3.0	2.0	1.0		1.0	1.0	1.0	1.2	1.8	1.6	1.1	1.1	1.8	3.8	4.9
15	4.2	3.4	2.2	1.6	1.2	1.4	1.4	1.4	1.3	1.5	1.6	1.8	1.9	1.9	1.8	1.7	1.8	2.4	2.6	2.7	3.5	4.2	1.9	0.7
16	0.6	0.6	0.6	0.6	0.6	0.7	0.9	1.6	1.5	1.0	0.9	0.7		0.7	0.8	1.1	1.0	1.1	1.2	0.8	0.7	0.6	0.5	0.5
17	0.4	0.4	0.4	0.4	0.4	0.6	0.9	1.1	1.2	1.0	0.7	0.7		0.9	0.8	0.8	1.1	1.4	1.6	2.6	1.3	1.7	1.1	1.1
18	0.8	0.8	1.0	0.5	0.4	0.7	1.1	1.6	1.4	1.2	0.7	1.6		0.8	0.6	0.7	0.8	1.0	1.1	1.6	1.8	2.2	2.5	2.3
19	1.4	1.0	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.9	0.9	0.9	0.8	0.7	0.7	0.8	0.7	0.6	0.6	0.5	0.6	1.1	1.2
20	1.5	1.3	1.0	0.8	0.5	0.4	0.6	0.8	0.6	0.6	0.5	0.5	0.8	0.6	0.6	0.5	0.5	0.9	0.9	0.9	0.9	1.3	2.0	1.8
21	1.5	0.8	0.7	0.4	0.4	0.4	0.6	0.9	0.9	0.8	1.0	0.8	0.6	0.6	0.5	0.6	0.5	0.6	0.6	0.8	1.1	1.6	1.3	2.1
22	1.5	2.3	2.7	2.5	2.6	1.9	4.8	9.4	4.0	1.4	0.6	0.7	0.6		0.6	0.6	0.7	0.9	0.9	1.0	1.2	1.8	2.7	3.2
23	2.4	1.8	1.1	1.3	0.7	1.1	2.8	3.3	3.4	2.8	1.7	1.4		0.9	0.7	0.7	0.8	1.1	1.3	0.9	0.9	1.3	3.3	4.0
24	3.5	2.4	1.0	1.0	0.9	1.2	1.8	4.9	4.2	2.2	1.8	1.3		1.0	0.8	1.0	1.0	1.2	1.7	1.5	1.3	1.1	1.4	0.6
25	0.9	1.7	2.2	1.8	1.2	1.3	1.3	1.5	1.9	2.1	1.8	2.0		1.4	0.9	0.9	0.9	1.0	1.0	1.0	0.9	0.8	0.7	0.6
26	0.5	0.4	0.4	0.2	0.2	0.2	0.3	0.5	0.7	0.8	1.0	0.7	0.7	0.7	0.7	0.8	1.1	0.7	0.4	0.3	0.3	0.4	0.4	0.0
27	0.4	0.4	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.3	0.2	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4
28	0.3	0.3	0.3	0.2	0.3	0.4	0.6	1.2	1.3	1.1	0.7	0.6		0.5	0.5	0.5	0.6	1.1	1.3	1.5	1.6	1.9	3.0	3.6

VEHICLE COUNT RECORD

COUNTY: SANTA CLARA
ROUTE: 280
DIRECTION: SOUTHBOUND
LOCATION: DE ANZA BLVD. DIAGONAL ON-RAMP

DATE / DAY	12/22/93 WEDNESDAY		12/23/93 THURSDAY		1/26/94 WEDNESDAY		1/27/94 THURSDAY		1/28/94 FRIDAY	
TIME PERIOD	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME
2400 - 0100		1,002		495		722		741		911
0100 - 0200		478		314		358		397		451
0200 - 0300		339		189		265		233		304
0300 - 0400		180		205		146		130		176
0400 - 0500		214		563		158		178		201
0500 - 0600		586		1,601		635		634		615
0600 - 0700		4,711		3,737		2,057		2,104		1,985
0700 - 0800		4,106		4,917		5,637		5,676		5,369
0800 - 0900		5,333		4,691		6,287		6,292		6,296
0900 - 1000		4,741		5,062		4,667		4,937		4,732
1000 - 1100		4,552				3,981		4,155		4,435
1100 - 1200		5,312				4,669		4,752		5,104
1200 - 1300		5,426				4,967		5,135		5,437
1300 - 1400		5,778				5,145		5,343		
1400 - 1500		6,473				5,869		5,886		
1500 - 1600	1452	7,199				6,892	1283	7,031		
1600 - 1700	1256	7,685				7,521	1088	7,235		
1700 - 1800	1129	6,749				7,608	1045	7,263		
1800 - 1900		6,321				6,551		6,882		
1900 - 2000		5,026				5,409		5,415		
2000 - 2100		3,725				3,806		4,296		
2100 - 2200		3,516				3,853		3,833		
2200 - 2300		2,831				2,847		2,746		
2300 - 2400		1,924				1,448		1,826		
TOTAL		94,207				91,498		93,120		

VEHICLE COUNT RECORD

COUNTY: SANTA CLARA
ROUTE: 101
DIRECTION: NORTHBOUND
LOCATION: BLOSSOM HILL RD. DIAGONAL ON-RAMP

DATE DAY	1/24/94 MONDAY		1/25/94 TUESDAY		1/26/94 WEDNESDAY		1/27/94 THURSDAY		1/28/94 FRIDAY	
TIME PERIOD	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME
2400 - 0100		479		393		373		389		440
0100 - 0200		302		313		301		278		313
0200 - 0300		306		264		267		293		280
0300 - 0400		396		367		347		367		403
0400 - 0500		769		781		797		764		795
0500 - 0600		2,429	87	2,367	95	2,436	94	2,439	87	2,408
0600 - 0700		4,930	229	4,977	216	5,204	224	5,233	217	5,011
0700 - 0800		6,143		6,069	473	6,849	453	6,932	417	6,610
0800 - 0900		4,442	204	4,828	174	4,619	181	4,891	194	4,724
0900 - 1000		3,265		3,404		3,480		3,496		
1000 - 1100		2,763		2,813		2,889		2,896		
1100 - 1200		2,914		2,868		2,950		3,021		
1200 - 1300		2,810		2,764		2,787		3,027		
1300 - 1400		2,702		2,712		2,828		2,836		
1400 - 1500		3,032		3,146		3,116		3,267		
1500 - 1600		3,298		3,480		3,548		3,837		
1600 - 1700		3,374		3,612		3,855		3,932		
1700 - 1800		3,556		3,651		4,028		4,139		
1800 - 1900		2,730		2,829		3,164		3,223		
1900 - 2000		1,865		1,859		2,042		2,067		
2000 - 2100		1,383		1,361		1,449		1,614		
2100 - 2200		1,176		1,184		1,224		1,412		
2200 - 2300		953		966		1,020		992		
2300 - 2400		926		954		924		923		
TOTAL		56,943		57,962		60,497		62,268		

VEHICLE COUNT RECORD

COUNTY: SANTA CLARA
ROUTE: 101
DIRECTION: NORTHBOUND
LOCATION: BLOSSOM HILL RD. DIAGONAL ON-RAMP

DATE / DAY	1/31/94 MONDAY		2/1/94 TUESDAY		2/2/94 WEDNESDAY		2/3/94 THURSDAY		2/4/94 FRIDAY	
TIME PERIOD	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME
2400 - 0100		415		368		376		382		448
0100 - 0200		384		261		261		303		312
0200 - 0300		283		257		239		219		263
0300 - 0400		397		343		373		359		420
0400 - 0500		790		756		731		763		750
0500 - 0600		2,431	83	2,440	100	2,410	98	2,443	102	2,312
0600 - 0700		5,262		5,212	217	5,242	221	5,262	223	5,003
0700 - 0800		6,985	391	6,871	406	6,991	419	6,885	364	6,679
0800 - 0900		4,776	201	4,804	211	4,955	186	5,000	218	4,994
0900 - 1000		3,510		3,469		3,403		3,663		3,692
1000 - 1100		2,837		2,968		2,957		2,958		3,102
1100 - 1200		2,864		2,899		2,954		3,010		3,258
1200 - 1300		2,899		2,776		2,900		2,951		3,200
1300 - 1400		2,807		2,823		2,685		2,869		
1400 - 1500		3,271		3,149		3,176		3,412		
1500 - 1600		3,786		3,871		3,804		3,907		
1600 - 1700		3,758		3,838		4,055		4,106		
1700 - 1800		3,809		4,046		4,190		4,304		
1800 - 1900		2,952		3,066		3,244		3,314		
1900 - 2000		1,961		2,025		2,011		2,250		
2000 - 2100		1,431		1,493		1,498		1,581		
2100 - 2200		1,205		1,301		1,297		1,343		
2200 - 2300		934		975		1,000		1,054		
2300 - 2400		913		939		951		947		
TOTAL		60,660		60,950		61,703		63,285		

VEHICLE COUNT RECORD

COUNTY: SANTA CLARA
ROUTE: 101
DIRECTION: NORTHBOUND
LOCATION: BLOSSOM HILL RD. DIAGONAL ON-RAMP

DATE / DAY	2/7/94 MONDAY		2/8/94 TUESDAY		2/9/94 WEDNESDAY		2/10/94 THURSDAY		2/11/94 FRIDAY	
TIME PERIOD	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME
2400 - 0100		452		378		412		469		470
0100 - 0200		274		233		287		320		338
0200 - 0300		292		253		218		265		307
0300 - 0400		340		353		345		380		385
0400 - 0500		742		755		750		791		772
0500 - 0600	85	2,395	87	2,341	104	2,413	84	2,397	107	2,274
0600 - 0700	219	5,060	232	5,274	208	5,123	230	5,203	207	4,914
0700 - 0800	462	6,718	395	6,845	506	6,929	439	6,995		6,334
0800 - 0900	181	4,899	180	4,924	188	4,785	185	4,964	168	4,779
0900 - 1000		3,603		3,505		3,408		3,441		3,579
1000 - 1100		2,954		2,915		2,953		2,958		3,185
1100 - 1200		2,956		2,878		3,030		3,010		3,395
1200 - 1300		2,969		2,813		2,813		2,991		3,270
1300 - 1400		2,801		2,815		2,790		2,959		3,393
1400 - 1500		3,200		3,133		3,147		3,375		
1500 - 1600		3,429		3,523		3,854		3,822		
1600 - 1700		3,482		3,718		3,819		3,831		
1700 - 1800		3,505		3,907		4,043		4,005		
1800 - 1900		2,595		2,990		3,151		3,031		
1900 - 2000		1,707		2,073		2,127		2,165		
2000 - 2100		1,261		1,447		1,580		1,580		
2100 - 2200		1,194		1,267		1,424		1,378		
2200 - 2300		827		929		1,059		1,068		
2300 - 2400		908		868		928		987		
TOTAL		58,563		60,137		61,388		62,385		

VEHICLE COUNT RECORD

COUNTY: SANTA CLARA
ROUTE: 101
DIRECTION: NORTHBOUND
LOCATION: BLOSSOM HILL RD. DIAGONAL ON-RAMP

DATE / DAY	2/14/94 MONDAY		2/15/94 TUESDAY		2/16/94 WEDNESDAY		2/17/94 THURSDAY		2/18/94 FRIDAY	
TIME PERIOD	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME
2400 - 0100		492		431		404		423		472
0100 - 0200		341		327		281		294		344
0200 - 0300		306		285		230		265		263
0300 - 0400		387		378		333		360		404
0400 - 0500		766		760		760		739		755
0500 - 0600	74	2,369	88	2,423	101	2,401	98	2,327	93	2,164
0600 - 0700	221	5,066	201	5,155	203	5,154	206	4,811	192	4,391
0700 - 0800	439	6,825	552	6,952	434	6,867		6,293	368	6,324
0800 - 0900	165	4,832	170	4,719	189	4,646	202	4,699	206	4,359
0900 - 1000		3,415		3,482		3,459		3,305		3,436
1000 - 1100		2,935		2,954		2,957		2,946		3,221
1100 - 1200		3,083		2,988		2,940		3,115		3,266
1200 - 1300		2,966		2,804		2,710		2,848		3,377
1300 - 1400		2,950		2,911		2,820		2,842		3,466
1400 - 1500		3,264		3,109		3,063		3,222		3,794
1500 - 1600		3,799		3,860		3,667		3,575		
1600 - 1700		3,766		3,858		3,838		3,705		
1700 - 1800		3,995		4,166		3,948		3,925		
1800 - 1900		3,144		3,158		3,161		3,032		
1900 - 2000		2,120		1,978		2,159		2,004		
2000 - 2100		1,577		1,399		1,447		1,482		
2100 - 2200		1,310		1,201		1,301		1,317		
2200 - 2300		988		911		939		1,071		
2300 - 2400		1,018		905		900		966		
TOTAL		61,714		61,114		60,385		59,566		

VEHICLE COUNT RECORD

COUNTY: SANTA CLARA
ROUTE: 101
DIRECTION: NORTHBOUND
LOCATION: BLOSSOM HILL RD. DIAGONAL ON-RAMP

DATE / DAY	2/21/94 MONDAY		2/22/94 TUESDAY		2/23/94 WEDNESDAY		2/24/94 THURSDAY		2/25/94 FRIDAY	
TIME PERIOD	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME
2400 - 0100		511		538		426		472		457
0100 - 0200		362		317		287		319		329
0200 - 0300		262		265		255		230		315
0300 - 0400		277		356		366		359		441
0400 - 0500		496		820		811		825		803
0500 - 0600		1,137	82	2,524	93	2,417	95	2,484	89	2,330
0600 - 0700		2,003	244	5,157	224	5,110	213	5,114	206	4,645
0700 - 0800		2,931	377	6,608	438	6,735	464	6,378		5,916
0800 - 0900		2,554	193	4,891	165	4,833	208	4,969	215	5,118
0900 - 1000		2,705		3,495		3,458		3,629		3,811
1000 - 1100		2,936		3,044		2,926		3,048		3,209
1100 - 1200		3,413		3,143		3,046		3,050		3,405
1200 - 1300		3,699		3,030		2,857		2,905		3,314
1300 - 1400		3,974		2,991		2,909		2,864		
1400 - 1500		3,978		3,233		3,107		3,250		
1500 - 1600		4,553		3,746		3,707		3,901		
1600 - 1700		4,615		3,831		4,018		3,872		
1700 - 1800		4,479		3,900		3,888		4,252		
1800 - 1900		4,180		3,104		3,254		3,524		
1900 - 2000		3,150		2,040		2,177		2,344		
2000 - 2100		2,246		1,418		1,427		1,603		
2100 - 2200		1,826		1,327		1,280		1,448		
2200 - 2300		1,308		1,060		1,032		1,152		
2300 - 2400		1,084		955		944		1,036		
TOTAL		58,679		61,793		61,270		63,028		

VEHICLE COUNT RECORD

COUNTY: SANTA CLARA
ROUTE: 101
DIRECTION: NORTHBOUND
LOCATION: BLOSSOM HILL RD. DIAGONAL ON-RAMP

DATE DAY	2/28/94 MONDAY		3/1/94 TUESDAY							
TIME PERIOD	RAMP VOLUME	FREEWAY VOLUME	RAMP VOLUME	FREEWAY VOLUME						
2400 - 0100		497		463						
0100 - 0200		357		306						
0200 - 0300		278		273						
0300 - 0400		364		358						
0400 - 0500		756		767						
0500 - 0600	86	2,398	85	2,434						
0600 - 0700	231	5,032	230	5,137						
0700 - 0800		6,708	509	6,917						
0800 - 0900	192	4,909		4,843						
0900 - 1000		3,481		3,459						
1000 - 1100		2,945		2,954						
1100 - 1200		2,996		3,009						
1200 - 1300		2,782		2,786						
1300 - 1400		2,892								
1400 - 1500		3,125								
1500 - 1600		3,662								
1600 - 1700		3,761								
1700 - 1800		3,890								
1800 - 1900		2,948								
1900 - 2000		2,165								
2000 - 2100		1,629								
2100 - 2200		1,307								
2200 - 2300		916								
2300 - 2400		964								
TOTAL		60,762								

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY PETE WILSON, *Governor*

DEPARTMENT OF TRANSPORTATION
BOX 23660
OAKLAND, CA 94623-0660
(510) 286-4444
TDD (510) 286-4454

October 25, 1993

Dear Resident,

Have you ever wondered about the air quality in your neighborhood?
We have.
Have you ever wondered about the freeway system and your air quality?
We do all the time.

Caltrans is committed to providing transportation service and enhanced mobility to the public in as cost-effective and environmentally conscious a manner as possible. Ramp metering is one of the most effective and inexpensive tools we have. It allows us to manage traffic merging onto the freeway during periods of heavy traffic, reducing stop-and-go congestion so that the freeway stays flowing smoothly, thereby allowing more people to get to their destinations more quickly *without costly expansion of freeway capacity*. With ramp metering, a few seconds of your time at the on-ramp can save you minutes on your rush hour trips.

We know that due to its effect on congestion reduction, ramp metering has significant regional air quality benefits. And we have computer models that are state-of-the-art at predicting air quality fairly accurately, but no amount of computer analysis can substitute for field measurements, especially near on-ramps. This is why Caltrans is particularly interested in measuring the air quality directly adjacent to metered on-ramps, like the one near your home.

Please take a moment to consider helping us collect this kind of information by allowing us to place an air quality measuring device on your property for approximately two months. If you think you might be interested, please call Michael Markowitz, Regional Air Quality Specialist, collect at (510) 286-5661, between 9 AM and 5:30 PM within the next week or so.

Thank you for taking the time to think about volunteering your assistance.

Sincerely,

JOE BROWNE
District Director

by: D. Steinhauser

DIANNE STEINHAUSER, Chief
Environmental Engineering Branch

PERMIT TO ENTER

Date: December 8, 1993

E.A. 132451

State of California
Department of Transportation
Post Office Box 23660
Oakland, CA 94623-0660

Permission is hereby granted to the STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, hereinafter referred to as STATE, to enter upon our lands, for the purpose of conducting an air quality monitoring study according to the following details:

1) OWNER agrees to allow STATE to park a van containing a carbon monoxide (CO) analyzer, its accompanying data recording unit, a tank of gas containing a safe standardized concentration of CO, and a thermostatically controlled electric heater, on OWNER's property in the parking lot adjacent to the De Anza Blvd. on-ramp to southbound I-280, in the first two parking slots east of the landscaping, approximately 330 feet east of the air conditioning control building.

2) OWNER agrees to provide STATE electrical power for said equipment at the electrical control room for the air conditioning plant in the northwest corner of the site. STATE will provide and locate 500 feet of weatherproof #12, 3 conductor Type S electrical extension cable to OWNER's satisfaction from the electrical room to the van. Power consumption by the test equipment will be approximately 200 Watts continuously, and by the heater, 600 Watts intermittently as needed to prevent internal temperature of the van from dropping below 60 degrees Fahrenheit.

3) OWNER agrees to allow STATE access to said van and equipment. After initial set-up, access will be needed approximately three times a week for approximately 15 minutes for the duration of the study to calibrate the analyzer and download data. STATE agrees to verbally notify OWNER in advance of each access visit.

4) OWNER acknowledges that study will last roughly two months, from December 8, 1993, to February 28, 1994.

The rights and privileges hereby granted to STATE, may at the option of the STATE, be exercised by any authorized agent or contractor of STATE.

By acceptance of this Permit to Enter, it is expressly understood and agreed by and between the parties that STATE agrees to indemnify and save the undersigned OWNERS harmless against any and all loss, damage, and/or liability which may be suffered or incurred by OWNERS and against any and all claims,

demands, and causes of action that may be brought against OWNERS caused by, or arising out of, or in any way connected with the use and/or occupancy of said lands of OWNERS by STATE, its agents, contractors or assigns. STATE further agrees to assume full responsibility for any and all damages caused by STATE'S operation under this Permit and STATE shall, at its option, either repair or pay for such damages.

Sincerely,

Cupertino Gateway Partners
a California general partnership

By: ACI Real Properties, Inc.,
a Delaware corporation
Its: General Partner

By: _____

Its: _____

Date: _____

RECOMMENDED FOR APPROVAL:

_____

Right of Way Agent

_____

ACCEPTED:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

_____

W. J. DOWD, Chief
R/W Acquisition Services

PERMIT TO ENTER

Date: December 9, 1993

E.A. 132451

State of California
Department of Transportation
Post Office Box 23660
Oakland, CA 94623-0660

Permission is hereby granted to the STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, hereinafter referred to as STATE, to enter upon our lands, for the purpose of conducting an air quality monitoring study according to the following details:

1) **DESCRIPTION:** The OWNER hereby permits the STATE to access those certain premises with the appurtenances situated in the City of San Jose, County of Santa Clara, State of California and more particularly described as follows: access to the enclosed patio room at rear of house located at [redacted] Century Park Way for the purpose of placing test equipment and conducting an air quality monitoring study.

2) **TERM:** The term of this Permit shall commence on December 9, 1993 and shall end on January 31, 1994.

3) **COMPENSATION:** OWNER agrees to accept $300.00 from STATE upon completion of the study as full compensation for electrical power and inconvenience. If OWNER wishes, for any reason, to cancel this Permit before the end of the study, STATE will pay OWNER a pro-rated fraction of the $300.00. If STATE cancels early, STATE will pay the full $300.00.

4) **EQUIPMENT:** OWNER agrees to allow STATE to place a carbon monoxide (CO) analyzer, its accompanying data recording unit, a tank of gas containing a safe standardized concentration of CO, and a thermostatically controlled electric heater, on OWNER's property in the enclosed patio room at rear of house.

5) **ELECTRICITY:** OWNER agrees to provide STATE electrical power for said equipment. Power consumption by the test equipment will be approximately 200 Watts continuously, and by the heater, 600-1500 Watts intermittently as needed to prevent room temperature from dropping below 60 degrees Fahrenheit.

6) **ACCESS:** OWNER agrees to provide STATE access to said equipment upon reasonable verbal request by STATE of one to five days. After initial set-up, access will be needed approximately once a week for approximately 15 minutes for the duration of the study. All access to be at the convenience of the OWNER.

7) **AGENTS:** The rights and privileges hereby granted to STATE, may at the option of the STATE, be exercised by any authorized agent or contractor of STATE.

8) CLAIMS AND LIABILITIES: By acceptance of this Permit to Enter, it is expressly understood and agreed by and between the parties that STATE agrees to indemnify and save the undersigned OWNERS harmless against any and all loss, damage, and/or liability which may be suffered or incurred by OWNERS and against any and all claims, demands, and causes of action that may be brought against OWNERS caused by, or arising out of, or in any way connected with the use and/or occupancy of said lands of OWNERS by STATE, its agents, contractors or assigns. STATE further agrees to assume full responsibility for any and all damages caused by STATE'S operation under this Permit and STATE shall, at its option, either repair or pay for such damages.

Sincerely,

HENRY CHOE (OWNER)
[redacted] Century Park Way
San Jose, CA 95111

RECOMMENDED FOR APPROVAL:

MICHAEL C. WILLIAMS
Right of Way Agent

DIANNE STEINHAUSER, Chief
Environmental Engineering Branch

ACCEPTED:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

W. J. DOWD, Chief
R/W Acquisition Services

PERMIT TO ENTER

Date: February 1, 1994

E.A. 132451

State of California
Department of Transportation
Post Office Box 23660
Oakland, CA 94623-0660

Permission is hereby granted to the STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, hereinafter referred to as STATE, to enter upon our lands, for the purpose of conducting an air quality monitoring study according to the following details:

1) **DESCRIPTION:** The OWNER hereby permits the STATE to access those certain premises with the appurtenances situated in the City of San Jose, County of Santa Clara, State of California and more particularly described as follows: access to the enclosed patio room at rear of house located at [redacted] Century Park Way for the purpose of placing test equipment and conducting an air quality monitoring study.

2) **TERM:** The term of this Permit shall commence on February 1, 1994 and shall end on March 4, 1994. **This represents an extension of the original agreement dated December 9, 1993, which commenced December 9, 1993 and ended January 31, 1994.**

3) **COMPENSATION:** OWNER agrees to accept $250.00 from STATE upon completion of the study as full compensation for electrical power and inconvenience. If OWNER wishes, for any reason, to cancel this Permit before the end of the study, STATE will pay OWNER a pro-rated fraction of the **$250.00.** If STATE cancels early, STATE will pay the full **$250.00. This $250.00 is in addition to the $300.00 from the December 9, 1993, Permit to Enter.**

4) **EQUIPMENT:** OWNER agrees to allow STATE to place a carbon monoxide (CO) analyzer, its accompanying data recording unit, a tank of gas containing a safe standardized concentration of CO, and a thermostatically controlled electric heater, on OWNER's property in the enclosed patio room at rear of house.

5) **ELECTRICITY:** OWNER agrees to provide STATE electrical power for said equipment. Power consumption by the test equipment will be approximately 200 Watts continuously, and by the heater, 600-1500 Watts intermittently as needed to prevent room temperature from dropping below 60 degrees Fahrenheit.

6) **ACCESS:** OWNER agrees to provide STATE access to said equipment upon reasonable verbal request by STATE of one to five days. After initial set-up, access will be needed approximately once a week for approximately 15 minutes for the duration of the study. All access to be at the convenience of the OWNER.

7) **AGENTS:** The rights and privileges hereby granted to STATE, may at the option of the STATE, be exercised by any authorized agent or contractor of STATE.

8) **CLAIMS AND LIABILITIES:** By acceptance of this Permit to Enter, it is expressly understood and agreed by and between the parties that STATE agrees to indemnify and save the undersigned OWNERS harmless against any and all loss, damage, and/or liability which may be suffered or incurred by OWNERS and against any and all claims, demands, and causes of action that may be brought against OWNERS caused by, or arising out of, or in any way connected with the use and/or occupancy of said lands of OWNERS by STATE, its agents, contractors or assigns. STATE further agrees to assume full responsibility for any and all damages caused by STATE'S operation under this Permit and STATE shall, at its option, either repair or pay for such damages.

Sincerely,

HENRY CHOE (OWNER)
[redacted] Century Park Way
San Jose, CA 95111

RECOMMENDED FOR APPROVAL:

MICHAEL C. WILLIAMS
Right of Way Agent

DIANNE STEINHAUSER, Chief
Environmental Engineering Branch

ACCEPTED:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

W. J. DOWD, Chief
R/W Acquisition Services

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY PETE WILSON, *Governor*

DEPARTMENT OF TRANSPORTATION
BOX 23660
OAKLAND, CA 94623-0660
(510) 286-4444
TDD (510) 286-4454

March 1, 1994

Mr. Henry Choe
[redacted] Century Park Way
San Jose, CA 95111

Dear Mr. Choe:

On behalf of the California Department of Transportation, I would like to thank you for your participation in our air quality monitoring study.

Since the middle of December you have been kind enough to allow us into your home on more or less a weekly basis to collect our data. I am happy to inform you that the carbon monoxide levels we measured in your back yard were well below both State and Federal health standards, despite the proximity of your home to the Route 101 freeway and the Blossom Hill Ave. metered on-ramp.

As per our Permit To Enter agreements, the State will be sending you a total of $550.00 directly to your home address via the U.S. Mail. We would have liked to present you with a check the day our field personnel came to shut down the study, but we were not able to do so. Please accept my apologies for the delay. We will send you the money we owe you as soon as possible.

If you would like to talk to anyone about the results of the study or the status of your compensation, please call Michael Markowitz, Regional Air Quality Specialist, at (510) 286-5661.

Sincerely,

JOE BROWNE
District Director

by:

for DIANNE STEINHAUSER, Chief
Environmental Engineering Branch

MDM:mdm
bcc: DS, SC, CA/VS
Bill Dowd/Mike Williams -- R/W
Chron File, Proj File (EA 132451)

CO and Ramp Meters

Appendix J-1

MTC
METROPOLITAN
TRANSPORTATION
COMMISSION

February 18, 1994

Mr. Joe Browne, Director
Caltrans District 04
Box 23660
Oakland CA. 94623-0660

Dear Mr. Browne:

Your letter of December 27, 1993 invited MTC to attend a meeting to discuss air quality conformity determinations for ramp metering projects. Staff from MTC, Caltrans District 04, Caltrans Headquarters, and the Bay Area Air Quality Management District met on January 20, 1994 and developed a proposal for revising the approach for making conformity determinations for ramp metering projects. MTC's understanding of that approach, and the agreed to steps for implementing that approach, are presented below.

Caltrans District 04 has been actively monitoring CO concentrations at two metered on ramps with high traffic volumes located in high background areas in Santa Clara County since mid-December, 1993. Field monitoring will continue through the winter months when CO concentrations usually peak. To date, the maximum measured CO concentration of 7.1 ppm is well below the state (20.0 ppm) and federal (35 ppm) standards. This monitoring of actual conditions supports Caltrans contention that metering does not create CO hotspots.

At present, there is no accepted methodology for forecasting CO emissions at metered on ramps. JUMP Start project #3 included efforts to modify the CALINE model for signalized intersections so that it could address ramp meters, but this modified model results in forecasts of unprecedented and unbelievable CO concentrations. Until a workable procedure for a quantitative evaluation is developed, Caltrans will prepare conformity determinations of all ramp metering projects in the State based on a qualitative analysis. The evidence from the field monitoring and project corridor quantitative analysis support the validity of this approach. A recent lawsuit in Sacramento challenged several aspects of a Caltrans environmental analysis, including the analysis of ramp metering's impacts. Caltrans successfully defended its analysis in court, and is sending MTC copies of the relevant information.

The meeting concluded with the following action plan. Monitoring of CO levels will be included in future ramp metering projects, as appropriate. Caltrans will meet with the Air Resources Board to discuss whether a workable quantitative procedure is

JOSEPH P. BORT METROCENTER • 101 EIGHTH STREET • OAKLAND, CA 94607-4700
510/464-7700 • TDD/TTY 510/464-7769 • FAX 510/464-7848

possible, and the acceptability of using a qualitative approach for metering conformity determinations in combination with a monitoring program. Either through a meeting of the JUMP Start project #3 team or through circulation of a written description of the methodology for metering conformity determinations, concurrence on the new approach will be documented. Caltrans will then submit project review requests to MTC based on this approach. We anticipate receiving project review requests by the summer.

Caltrans leadership in bringing the partner agencies together and moving this JUMP Start project forward is appreciated.

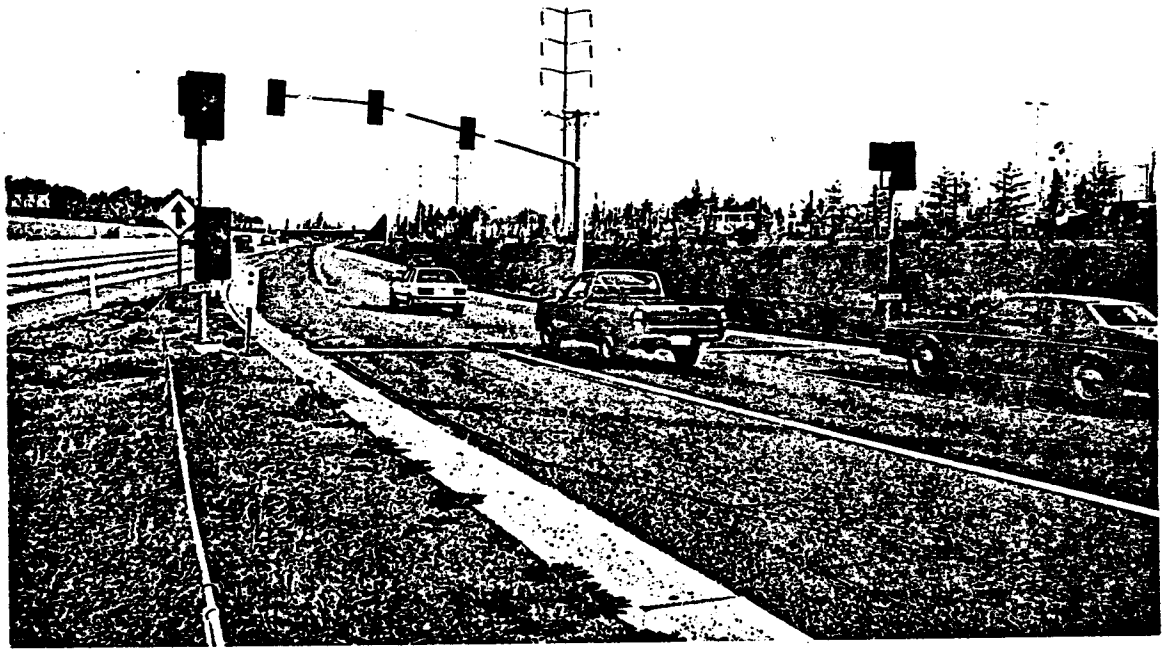
Sincerely yours,

William F. Hein
Deputy Executive Director

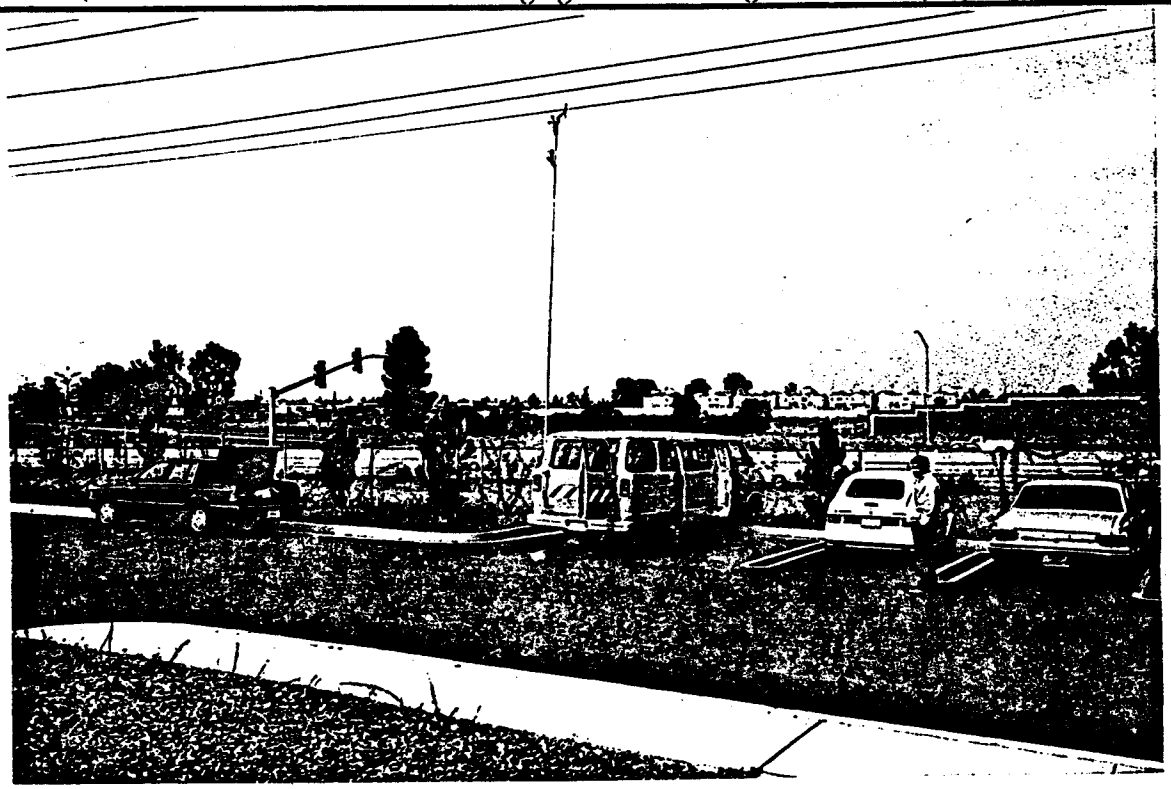
WFH:JG:cr

cc: Diane Steinhauser
Steve Borroum

SCL-280/De Anza Blvd. — Looking east from stop line.
(Note the van location just above the pick-up truck.)

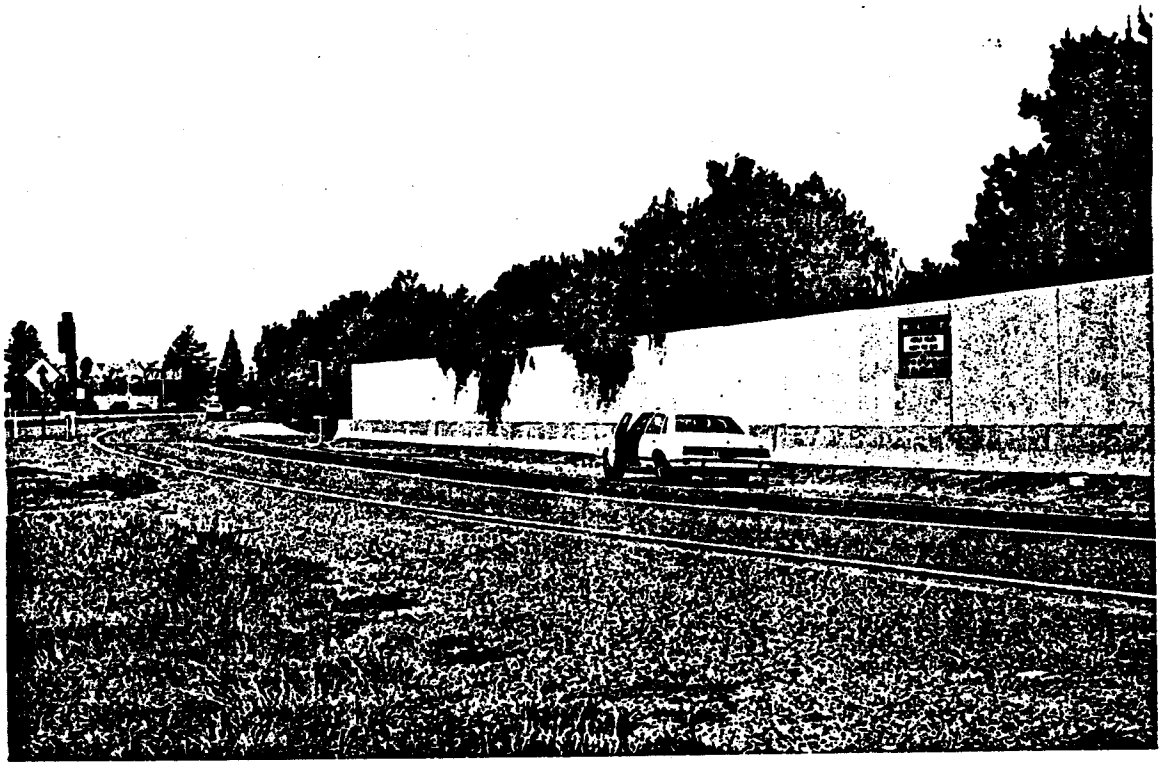


SCL-280/De Anza Blvd. — Looking northwest from parking lot.
(Note the wind vane and the metering lights in the background, directly upwind.)

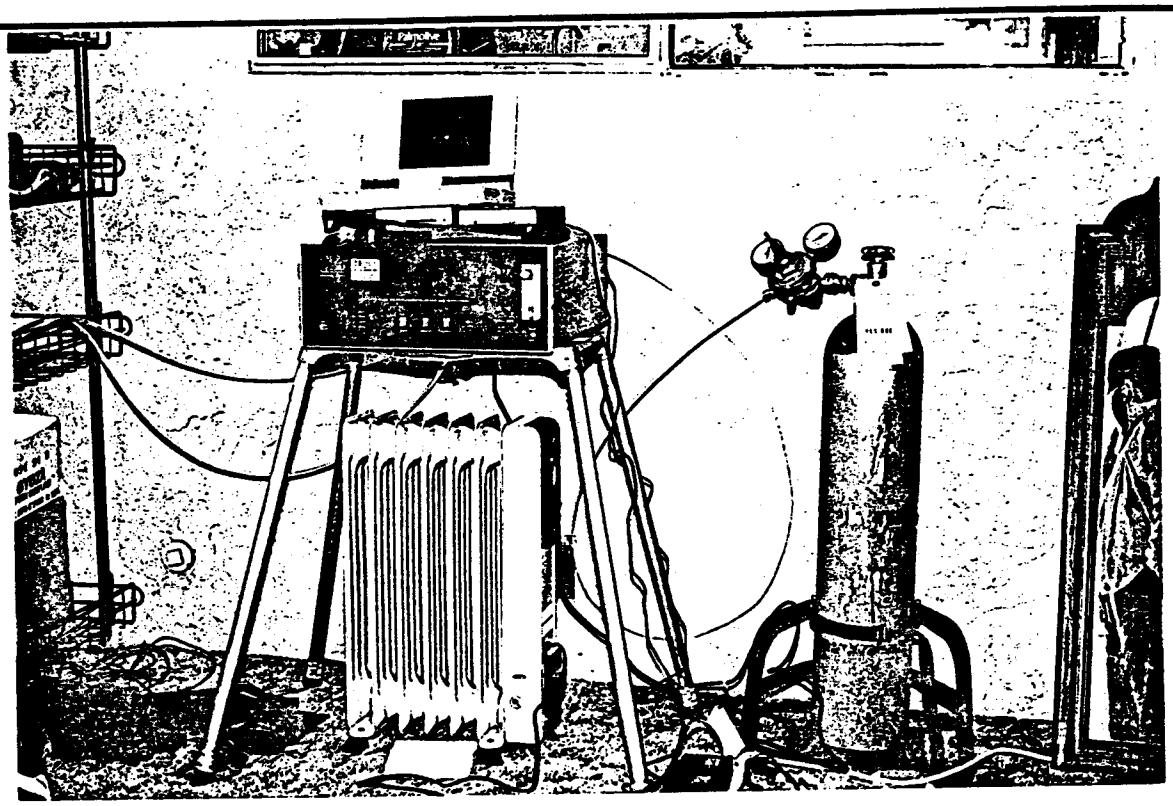


SCL-280/De Anza Blvd. — Equipment setup in the van.
(Note the Solomat analyzer on the floor and the heater in the back corner.)

SCL-101/Blossom Hill Rd. — Looking north.
(Note that the car is roughly adjacent to the monitor site's probe.)



SCL-101/Blossom Hill Rd. — Equipment setup.



SCL-101/Blossom Hill Rd. — Downloading weekly data.
(Note the thermograph on the stool in the foreground.)